KVIC MarketWatch

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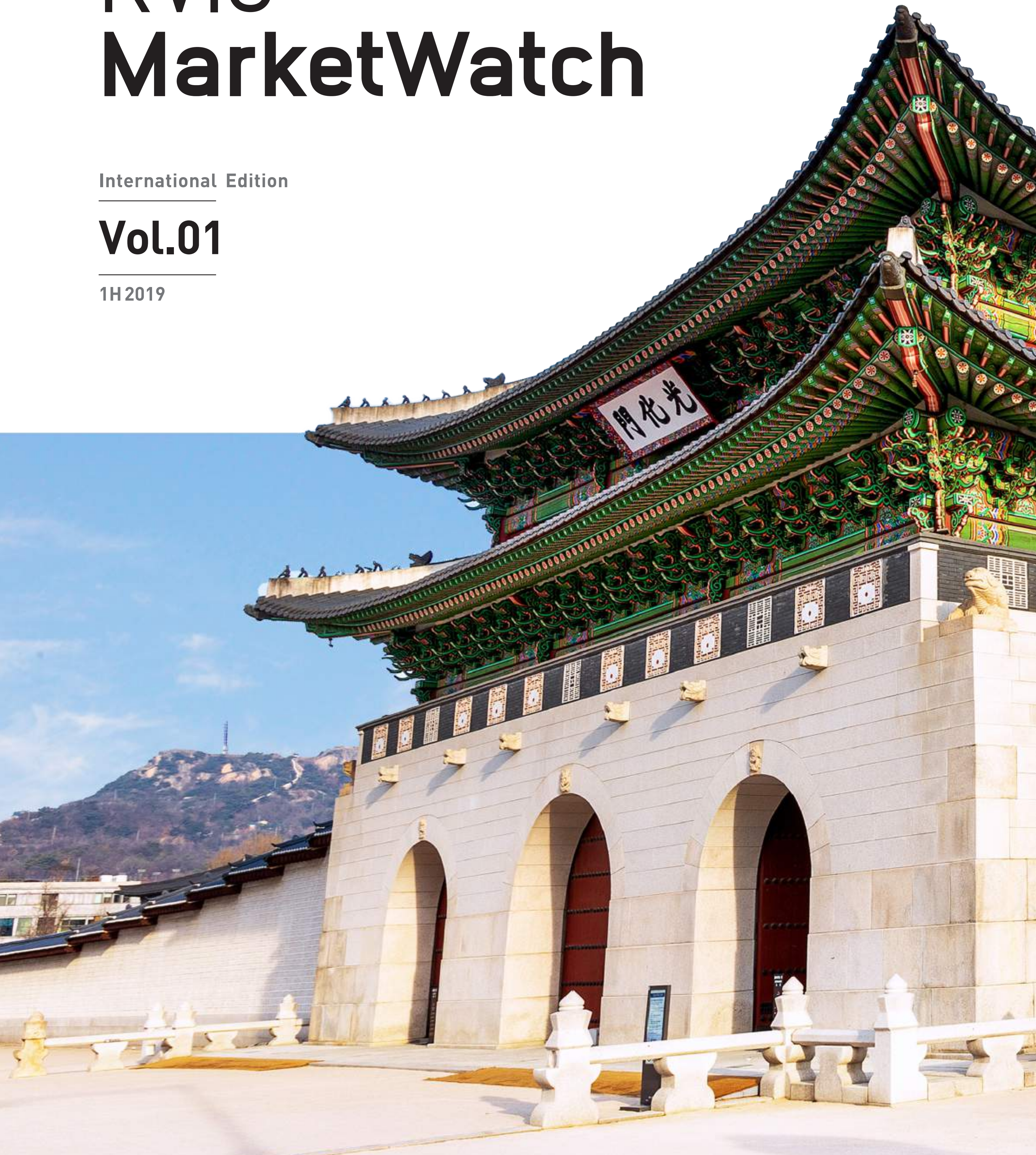

Korea Venture Investment Corp

Preface

Korea's venture capital (VC) ecosystem has been growing. Big Hit Entertainment, home to Kpop stars BTS, Krafton, the developer of global blockbuster online game PlayerUnknown's Battlegrounds, and Coupang, the e-commerce company that attracted investment from SoftBank Vision Fund, are all iconic VC-backed companies born in Korea. The country is home to nine unicorns included in the Global Unicorn Club released by CB Insights. According to OECD Entrepreneurship at a glance 2018, Korea ranked fourth in terms of venture capital investments as a percentage of GDP.

Despite the exponential growth in terms of both size and quality, the Korean VC market is still a relatively untapped market for global investors because market entry is not easy. One of major market entry barriers is a lack of market information that would help global investors grasp on the opportunities presented by the Korean market.

Korea Venture Investment Corp. (KVIC), which is the general partner of Korea Fund of Funds attracting capital commitments from 12 government agencies, and the largest anchor limited partner in the VC market, has decided to issue the international edition of KVIC MarketWatch in the hope that Korea's VC ecosystem will have a stronger global network.

This inaugural international edition of KVIC MarketWatch aims to shed light on the following features of the Korean VC market:

· In 2018, the VC market reached new heights in fundraising, investments and exits, growing 3.4x in fundraising, 3.9x in investments, and 2.8x in exits from 2009;
· The outlook for the startup ecosystem looks promising given high ICT adoption, R&D and innovation capabilities, and an abundance of highly educated workforce; and
· The government's strong policy commitment is expected to drive market-friendly changes and growth in the VC market.

We hope that the international edition of KVIC MarketWatch will help global readers better understand the relatively lesser-known Korean VC market. Going forward, we will strive to deliver quality, insightful content in order to help our readers find answers to their questions about the Korean market. Thank you.

October 2019

KVIC CEO **Young min Lee**

Disclaimer

KVIC MarketWatch has been prepared by Korea Venture Investment Corp. (KVIC).
It is a periodical publication intended to spur investments in SMEs
and startups, and to bring about a more sophisticated
industrial structure by reporting the performance of Korea Fund of Funds and other funds managed by KVIC.
The publication ultimately aims to serve public interest and support balanced economic growth.

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Contents

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An Introduction to

KVIC & Korea Fund of Funds

Fund Manager:
Korea Venture Investment Corp.

Korea Venture Investment Corp. (KVIC) was established with the aim of stimulating investment for the growth and development of small and medium-sized enterprises (SMEs) and startups.
KVIC serves as a general partner (GP) of government-backed funds of funds and direct co-investment funds pursuant to the Act on Special Measures for the Promotion of Venture Businesses.

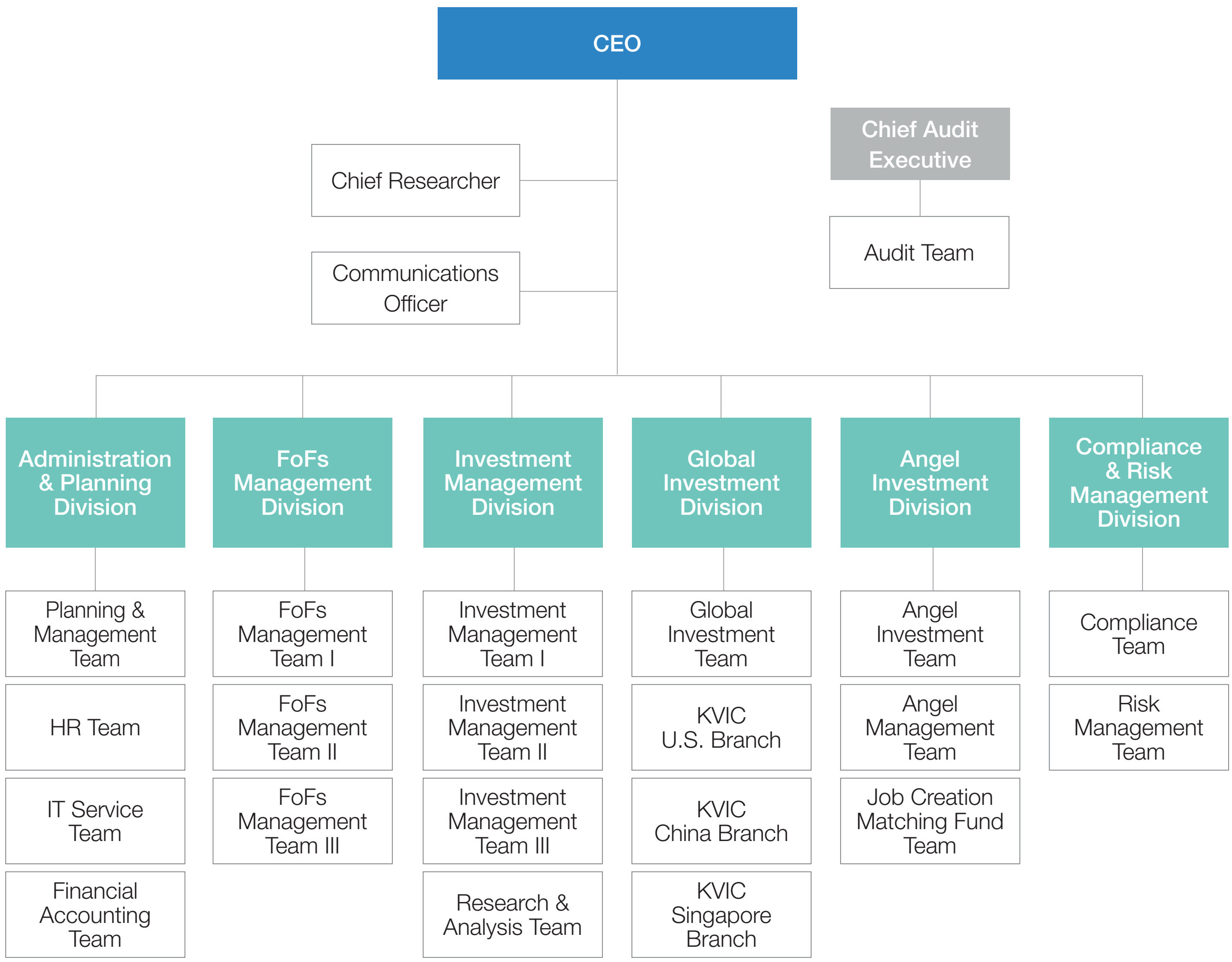
A Glimpse into KVIC History & Milestones

2018	June	Cumulative capital commitments to Korea Fund of Funds (KFoF) reached KRW 4 trillion.
2017	August	Cumulative commitments to KFoF totaled KRW 3 trillion.
	May	The Ministry of Education participated as a limited partner (LP) in KFoF.
	April	The Ministry of Environment became an LP in KFoF.
2016	October	KVIC launched Venture Investment Comprehensive System (VICS).
	June	Cumulative commitments to Foreign VC Investment Fund reached KRW 1 trillion.
2015	August	KVIC opened Korea Venture Investment Center in Singapore (KVIC Singapore Branch).
	May	Cumulative commitments to KFoF totaled KRW 2 trillion.
	January	Korea Sports Promotion Foundation (KSPO) became an LP in KFoF.
2014	June	KVIC opened Korea Venture Investment Center in China (KVIC China Branch).
2013	August	The Ministry of Health and Welfare became an LP in KFoF.
	August	KVIC launched Korea Venture Investment Center in the United States (KVIC U.S. Branch).
2012	June	M&A Matching Fund for SMEs and Startups was formed with capital commitments of KRW 30.5 billion.
2011	December	Angel Investment Matching Fund I was set up with capital commitments of KRW 10 billion.
	May	The Ministry of Employment and Labor participated as an LP in KFoF.
2010	August	The Korean Film Council joined as an LP in KFoF.
	June	The Korea Communications Commission became an LP in KFoF.
2009	September	Cumulative commitments to KFoF stood at KRW 1 trillion.
2006	June	The Ministry of Culture, Sports and Tourism participated as an LP in KFoF.
	May	The Korean Intellectual Property Office (KIPO) joined as an LP in KFoF.
2005	June	KFoF, a government VC program, was launched, and KVIC was formed for the purpose of managing KFoF.
	June	KVIC was designated as a GP of KFoF.
2004	December	The legal basis of KFoF formation and operation was laid down by amendments to the Act on Special Measures for the Promotion of Venture Businesses.
	December	The government announced measures to vitalize startups.
	July	The government unveiled its comprehensive initiative to strengthen the competitiveness of SMEs.

Organizational Structure

KVIC has six divisions, seventeen teams, and three offshore branches.

Figure 1 **KVIC Organizational Chart**



Korea Fund of Funds

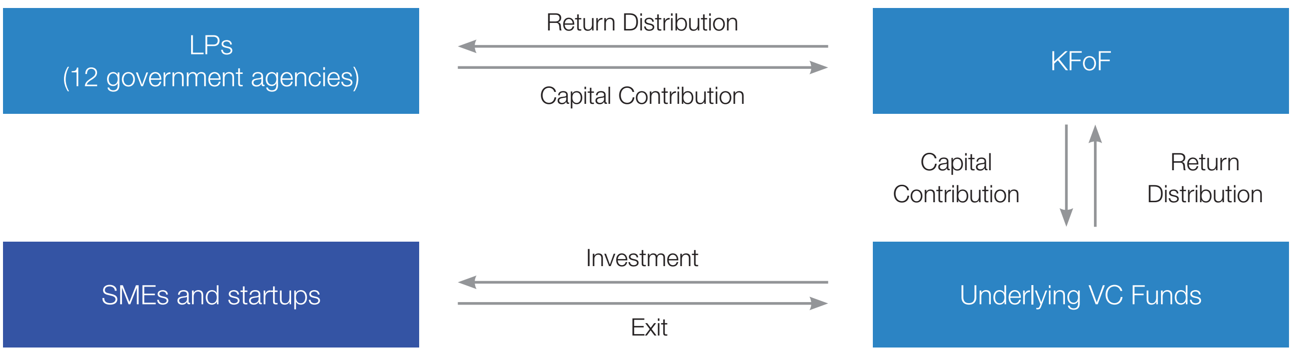
Korea Fund of Funds (KFoF) is a government-backed fund of funds that invests in venture capital (VC) funds managed by private VC firms.
Investors or limited partners (LPs) in KFoF are mainly government agencies that have committed capital for venture investments catering to their policy needs.
The underlying VC funds invest in SMEs and venture companies, playing an important part in creating a venture ecosystem.

Fund Overview

	Fund Profile
Date of Formation	July 15, 2005
Fund Size	KRW 4,029.7 billion (as at Dec. 31, 2018)
Size of Underlying Funds	KRW 21,930.5 billion (cumulative, as at Dec. 31, 2018)
Fund Term	30 years (2005-2035)
LPs (12 government agencies)	Korea SMEs and Startups Agency; Ministry of Culture, Sports and Tourism; Korean Intellectual Property Office; Korean Film Council; Ministry of Science and ICT (formerly called Ministry of Science, ICT and Future Planning); Ministry of Employment and Labor; Ministry of Health and Welfare; Korea Sports Promotion Foundation; Ministry of Environment; Ministry of Education; Ministry of Land, Infrastructure and Transport*; Ministry of Oceans and Fisheries*
GP	KVIC

* The Ministry of Land, Infrastructure and Transport, and the Ministry of Oceans and Fisheries are the new LPs that have got into KFoF in 2019.

Fund Structure



Other Funds of Funds

Foreign VC Investment Fund

Foreign VC Investment Fund (FVCIF) was first set up to invest in offshore VC funds managed by non-Korean VCs under the Measures to Develop a Virtuous Cycle in the Venture–Startup Funding Ecosystem, unveiled by the government on May 15, 2013. Its mandate is to help local SMEs and start-ups attract global investors and expand overseas.

	FVCIF I	FVCIF II
Date of Formation	October 4, 2013	July 15, 2016
Fund Size	KRW 135.4 billion (as at Dec. 31, 2018)	KRW 290.7 billion (as at Dec. 31, 2018)
Size of Underlying Funds	$1,942 million (cumulative, as at Dec. 31, 2018)	
Fund Term	21 years (2005-2035)	19 years (2016-2035)
LPs	KFoF/KVIC	KFoF/KVIC
GP	KVIC	

Angel Fund of Funds

Established in 2015, the Fund invests solely in angel funds that concentrate on startup or early-stage small businesses.

	Fund Profile
Date of Formation	November 18, 2015
Fund Size	KRW 53.7 billion (as at Dec. 31, 2018)
Size of Underlying Funds	KRW 79.57 billion (cumulative, as at Dec. 31, 2018)
Fund Term	20 Years (2015-2035)
LPs	KFoF/KVIC
GP	KVIC

KEBHana-KVIC Unicorns Fund of Funds

The Fund has officially launched its operations in 2019, primarily financed by KEB Hana Bank, with the aim of creating a venture ecosystem and nurturing unicorns. It makes indirect investments in SMEs and startups through its underlying funds.

	Fund Profile
Date of Formation	August 21, 2018
Fund Size	KRW 110 billion (as at Dec. 31, 2018)
Size of Underlying Funds	KRW 190 billion (expected)
Fund Term	10 years (2018-2028)
LPs	KEB Hana Bank/KFoF/KVIC
GP	KVIC

KEPCO Fund of Funds

The Fund is intended to foster the growth of the power and energy sectors, and to identify and nurture not only SMEs and startup companies related to ICT applications in the power and energy sectors but also those in Gwangju and South Jeolla Province (Jeonnam region) in which the Energy Valley is located. The primary LP or investor in the Fund is Korea Electric Power Corporation (KEPCO).

	Fund Profile
Date of Formation	August 19, 2015
Fund Size	KRW 52.5 billion (as at Dec. 31, 2018)
Size of Underlying Funds	KRW 88 billion (cumulative, as at Dec. 31, 2018)
Fund Term	10 years (2015-2025)
LPs	KEPCO/KFoF/KVIC
GP	KVIC

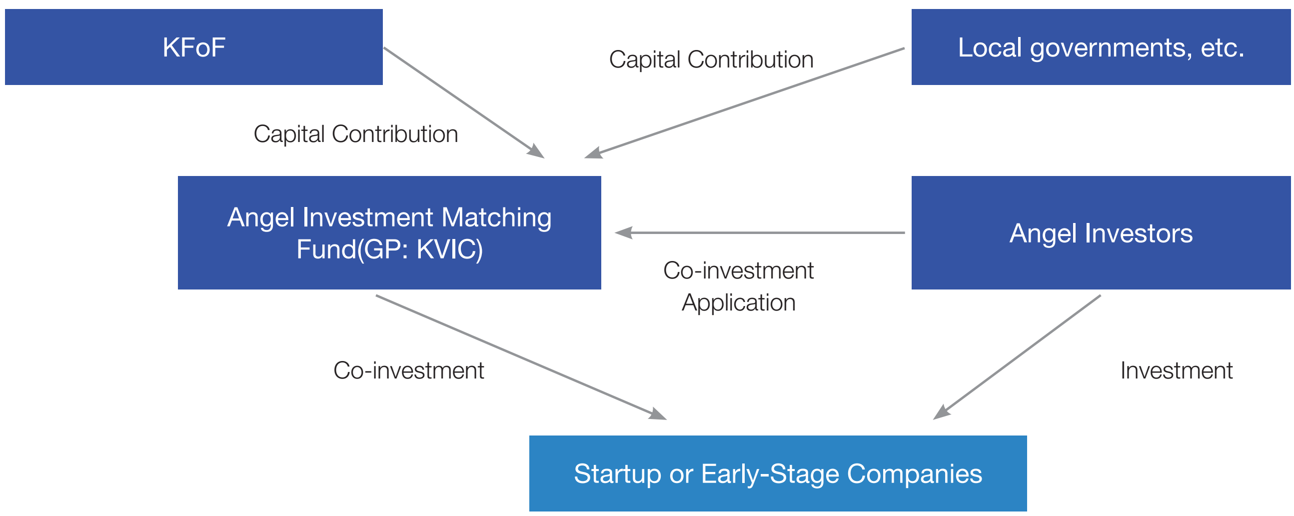
Other Funds

Other funds managed by KVIC include the Fund of Funds for Industrial Technology Commercialization (KRW 25 billion in assets under management or AUM), and KoFC-KVIC Job Creation Fund I and II (KRW 120 billion and KRW 107 billion in AUM, respectively). All the job creation funds are currently liquidating their investments.

Co-Investment Funds

Angel Investment Matching Fund

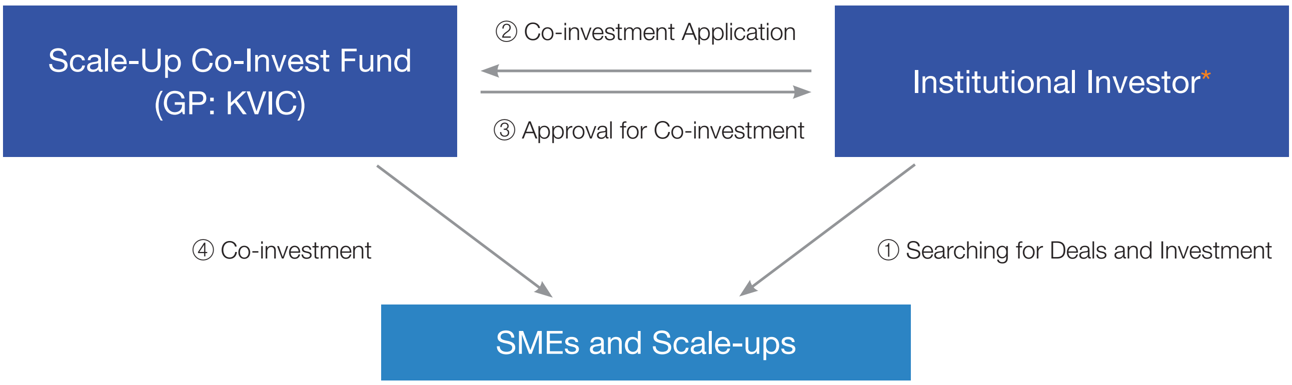
An angel investment matching fund in Korea refers to a public-private co-investment fund that is specially designed to nurture angel investors and angel clubs, thereby laying the foundation for startup creation and helping startup or early-stage companies fill their equity gaps. As of December 31, 2018, there were 16 angel investment matching funds with KRW 192 billion in aggregate AUM.



Scale-Up Co-Investment Fund

In August 2018, the Fund was formed for the first time in Korea to co-invest alongside institutional investors in SMEs and scale-up companies that are designated as a good job creator.

	Fund Profile
Date of Formation	August 2018
Fund Size	KRW 50.6 billion (as at Dec. 31, 2018)
Fund Term	8 years (2018-2025)
LPs	KFoF/KVIC
GP	KVIC



* Institutional investors that are qualified to manage small and medium enterprise establishment investment partnerships, Korea Venture Funds (KVFs), new technology venture investment partnerships, and private equity funds (PEFs).

For all figures in the article, the following conversion can be used for reference: USD 1=KRW 1,100.

2H2018

Korean VC Industry at a Glance

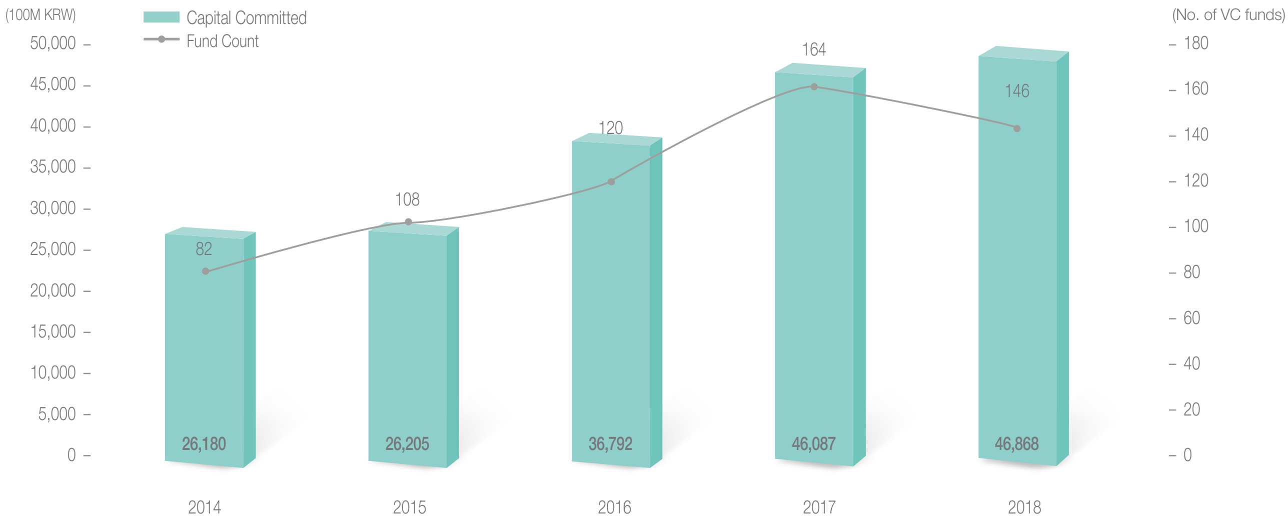
This report does not include PE investment data, and thus there may be some discrepancies between the overall VC market's performance and VC fund performance presented here.

Venture Capital Funds in Korea

Fundraising

Capital committed to venture capital (VC) funds[1] in Korea has continued to grow over the past five years, hitting a record high of KRW 4,686.8 billion in 2018.

Figure 1 5-year Trends in Capital Commitments to VC Funds



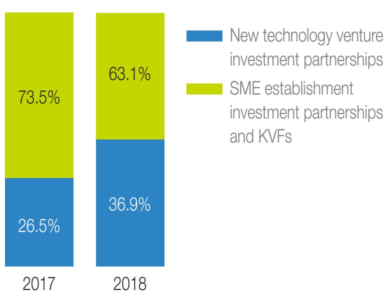
Source: KVCA

1) Major investment vehicles in the Korean VC market can be divided largely into small and medium enterprise (SME) establishment investment partnerships, Korea Venture Funds (KVFs), and new technology venture investment partnerships. The Ministry of SMEs and Startups is the competent authority for the first two types of VC funds, while the Financial Services Commission (FSC) is the competent authority for the third type of VC funds. Each of the competent authorities collates and analyzes VC data, and produces VC statistics annually. Among the three types of investment vehicles, SME establishment investment partnerships and KVFs together accounted for 73.5% of the total committed capital in 2017, and 63.1% in 2018, showing a slight YoY decline. Still, however, those VC funds are playing a dominant role in the VC market. This report, therefore, defines SME establishment investment partnerships and KVFs as VC funds, and is based on VC data from the Korea Venture Capital Association (KVCA).

Table 1 Major Investment Vehicles in the Korean VC Market

Vehicle	SME Establishment Investment Partnership	KVF	New Technology Venture Investment Partnership
Applicable Law	Support for Small and Medium Enterprises Establishment Act	Act on Special Measures for Venture Businesses	Specialized Credit Finance Business Act
GP	SME establishment investment company, new technology venture investment company, limited company, limited liability company, etc.	SME establishment investment company, new technology venture investment company, limited company, limited liability company, etc.	New technology venture investment company
Competent Authority	Ministry of SMEs and Startups (MSS)		Financial Services Commission (FSC)

Figure 2 SME Establishment Investment Partnerships and KVFs versus New Technology Venture Investment Partnerships (% of Investment Vehicles in the VC Market)

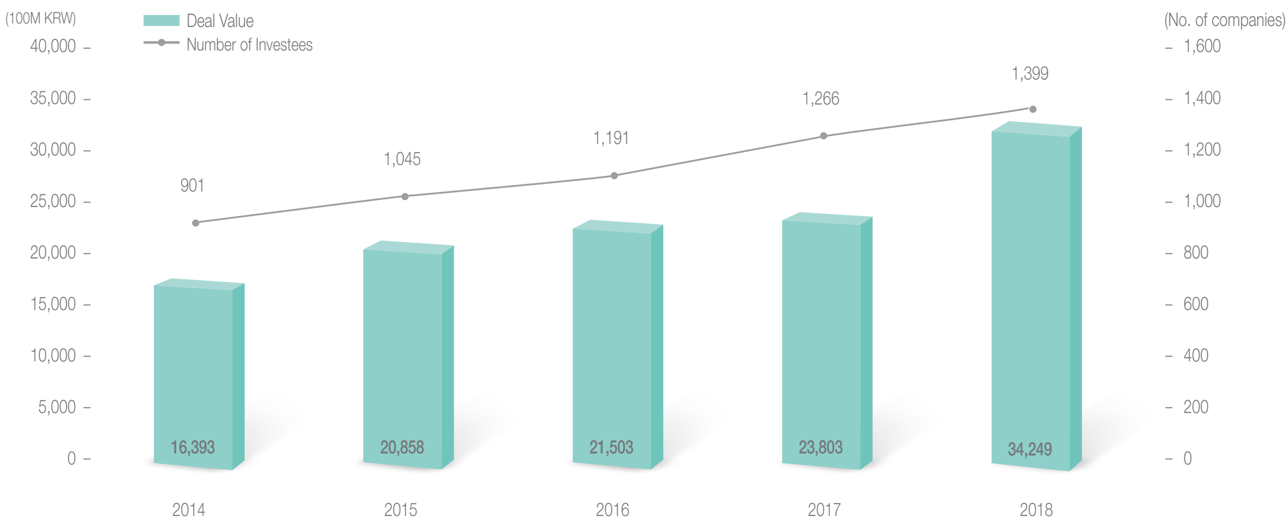


Investments

Investments by VC Funds

In 2018, Korean VC funds collectively invested KRW 3,424.9 billion in 1,399 companies, hitting an all-time high. The average size of the investment per company was KRW 2,450 million, up nearly KRW 600 million from KRW 1,880 million a year ago.

Figure 3 5-year Trends in Investments by VC Funds



* As of December 31, 2018

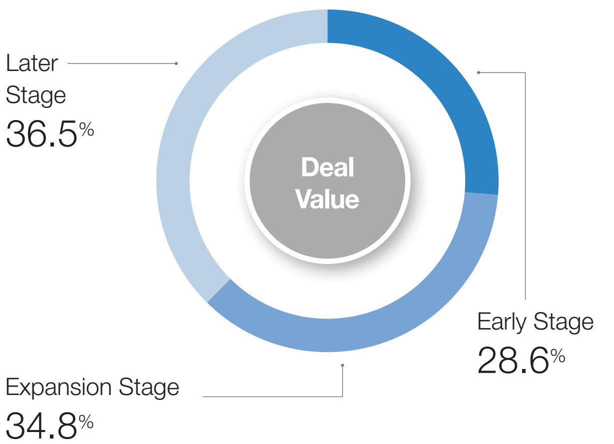
Source: KVCA

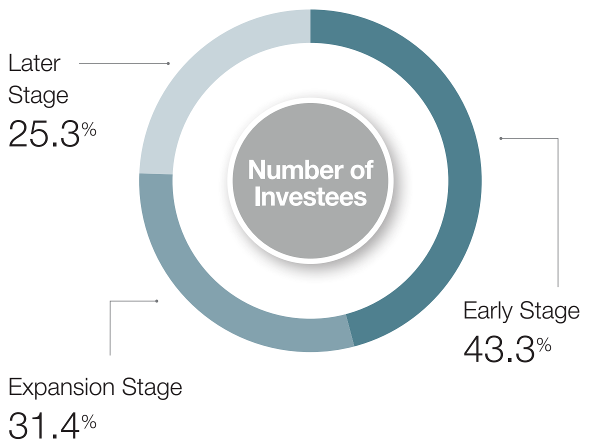
Deals by Stage and by Industry
(January to December 2018)

When it comes to 2018 deal activity by VC funds by stage[2)] in deal value terms, later-stage companies received the largest share (36.5%) of VC funding, totaling KRW 1,250.4 billion, expansion-stage companies KRW 1,193.5 billion (34.8%), and early-stage companies KRW 981 billion (28.6%). Meantime, when breaking down the number of investees by stage, early-stage, expansion-stage and later-stage companies made up 43.3%, 31.4%, and 25.3% of the total investee companies, respectively.

Biotechnology/healthcare was the most active industry[3)] or VC investment in Korea, securing KRW 841.7 billion and representing 24.6% of the overall deal value, followed by ICT services with KRW 746.8 billion (21.8%), and distribution/services with KRW 572.6 billion (16.7%). When breaking down the number of investee companies by industry, ICT services, distribution/services, and biotechnology/healthcare accounted for 24.2%, 16.8%, and 15.5% of all the investee companies in 2018, respectively.

Figure 4 **2018 Deal Activity by Stage-VC Funds**





Source: KVCA

2) Stages of a startup are determined based on the duration from the date on which a company is founded to the time capital is invested in the company. This indicates information about what stage an investee company has raised capital from a VC fund (early stage: less than 3 years/expansion stage: 3-7 years/later stage: more than 7 years).

3) Industry classification is based on the Korean Standard Industrial Classification published by Statistics Korea.

Figure 5 2018 Deal Activity by Industry-VC Funds

No	Sector	% of Total
1	Biotech/Healthcare	**24.6**
2	ICT Services	**21.8**
3	Distribution/Services	**16.7**
4	Film and TV/Performing Arts/ Recording	**9.7**
5	Electrics/Machinery/Equipment	**8.7**
6	Other	**6.1**
7	ICT Manufacturing	**4.3**
8	Game	**4.1**
9	Chemicals/Materials	**3.9**

No	Sector	% of Total
1	ICT Services	**24.2**
2	Distribution/Services	**16.8**
3	Biotech/Healthcare	**15.5**
4	Film and TV/Performing Arts/ Recording	**17.9**
5	Electrics/Machinery/Equipment	**9.3**
6	Other	**6.1**
7	ICT Manufacturing	**5.3**
8	Chemicals/Materials	**4.5**
9	Game	**4.5**

Source: KVCA

Industry	Sub-Industry*
ICT Manufacturing	Semiconductor/other electronic components; computer/peripheral equipment; broadcasting and communications equipment; audio and video equipment
ICT Services	Communications; software publishing; information services
Electrics/ Machinery/ Equipment	Electrical equipment; general purpose machinery; transport equipment/parts; precision instruments
Chemicals/Materials	Chemical materials/products; rubber/plastics; metals; non-metallic minerals
Biotech/Healthcare	Medical devices; medical materials/pharmaceuticals; healthcare facilities/services
Film and TV/ Performing Arts/ Recording	Publishing/broadcasting; audiovisual content; performing arts/exhibition/music
Game	Game; software; sports/leisure
Distribution/Services	Wholesale and retail trade; transportation; accommodation/food services; education; professional services
Other	Food and beverages; textiles/clothing/leather; wood/paper/printing/furniture; energy/ resources; construction; finance; real estate/renting and leasing; other

* KVCA and KVIC sort portfolio companies into 9 indusries and 36 sub-industries, and collate data accordingly.

Exits

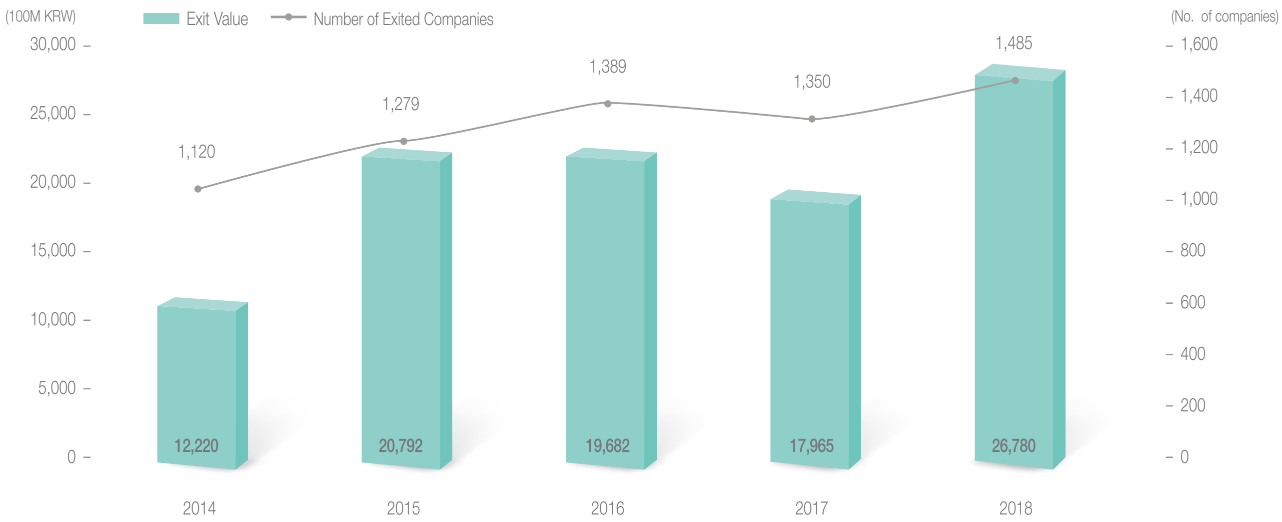
Exits by VC Funds

2018 saw 1,485 exits of VC-backed companies valued at an aggregate KRW 2,678.0 billion (including KRW 1,503.8 billion in initial investments and KRW 1,174.2 billion in returns), generating a 1.8x return. The exit value and the number of companies exited set new records, with 49.1% and 10.0% increases YoY, respectively.

Exits by Route

The most favored exit routes for Korean VC funds are secondary sales (in which the VC sells its shares to a third party in the OTC market) and buybacks (in which the entrepreneur or company repurchases the VC's shares), and initial public offerings (IPOs). Secondary sales and buybacks, and IPOs accounted for 47.6% (KRW 1.2754 trillion) and 32.5% (KRW 871.1 billion) of exits in 2018, respectively.

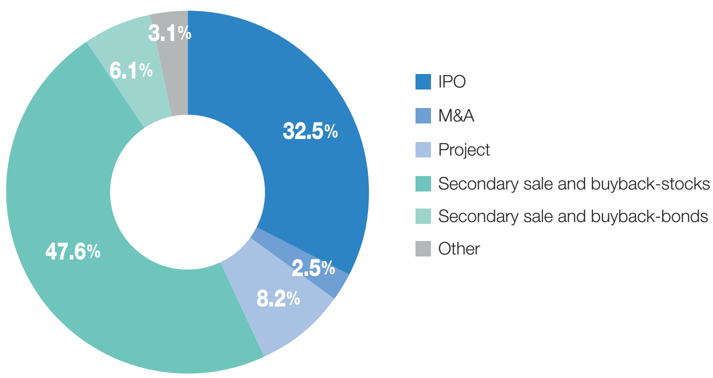
Figure 6 5-year Exit Trends



* As of December 31, 2018

Source: KVCA

Figure 7 Exits by Route



Source: KVCA

For all figures in the article, the following conversion can be used for reference: USD 1=KRW 1,100.

Why Invest in Korea:

VC Market and Investment Climate

The most well-known startup ecosystem in the world is Silicon Valley. Tech talent, entrepreneurship, networks, abundant capital, and vibrant M&A activity have worked in synergy with one another, making a startup ecosystem in Silicon Valley thrive over time. With the emergence of a “new normal,” countries around the world have been creating startup ecosystems, which will be the epicenter of innovation in their own country, in an effort to stimulate the economy. Benchmarking healthy and thriving startup ecosystems in other countries, they have implemented diverse policies aimed at building an enabling environment for startups to develop and flourish. Korea is no exception.

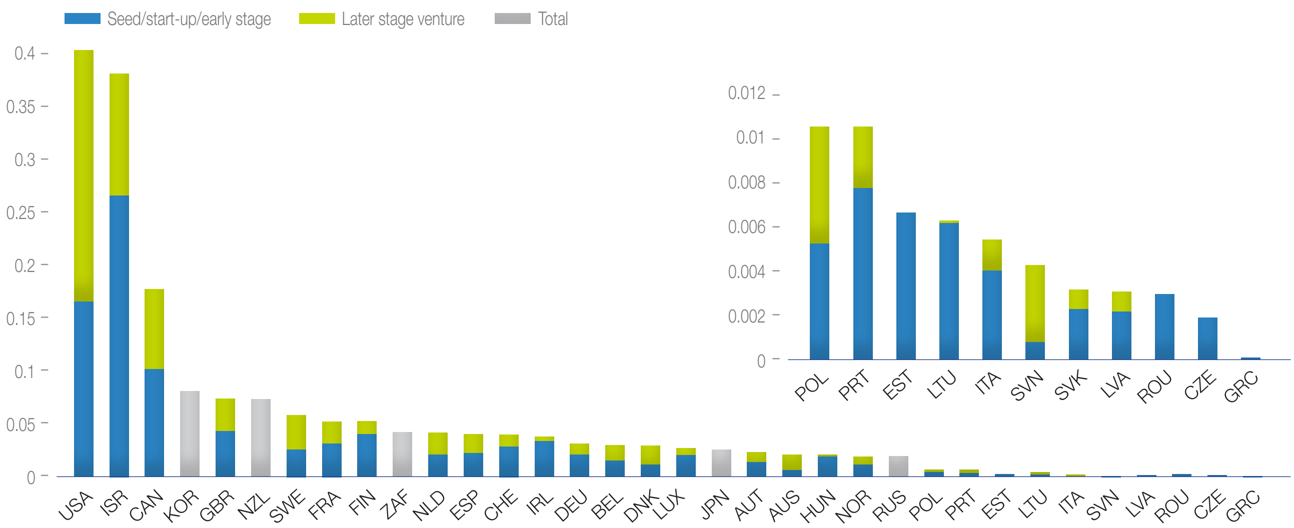
The country with the world's 12th largest economy (according to the World Bank’s 2017 data) has constantly strived to foster a startup-friendly environment in order to draw top talent into the startup ecosystem and encourage them to start and scale up new businesses.

This effort has started delivering results. According to OECD Entrepreneurship at a Glance Highlights 2018, venture capital (VC) investments as a percentage of GDP were less than 0.05% in the majority of OECD countries in 2017. Korea ranked 4th with VC investments representing 0.08% of GDP, behind the United States (0.40%), Israel (0.38% in 2014), and Canada (0.18%). In addition, it took 6th place in the number of unicorns based on the Global Unicorn Club from CB insights, with eight unicorns raising rounds with a valuation of at least USD 1 billion as of June 12, 2019,[1] behind the United States, China, the United Kingdom, India, and Germany.

Korea's VC market is relatively less known despite its attractive startup ecosystem for both entrepreneurs and investors. In this article of KVIC Market-Watch, we will walk you through the Korean VC market.

Figure 1 **Venture Capital Investments as a Percentage of GDP**
(Percentage, 2017, or latest available year)

Source: OECD Entrepreneurship Financing Database (EFD)



1) Korean unicorns are listed in order of valuation according to CB Insights: Coupang, Krafton (formerly Bluehole), Yello Mobile, Woowa Brothers, L&P Cosmetics, Wemakeprice, Viva Republica (Toss), and Yanolja.

Korean VC Market

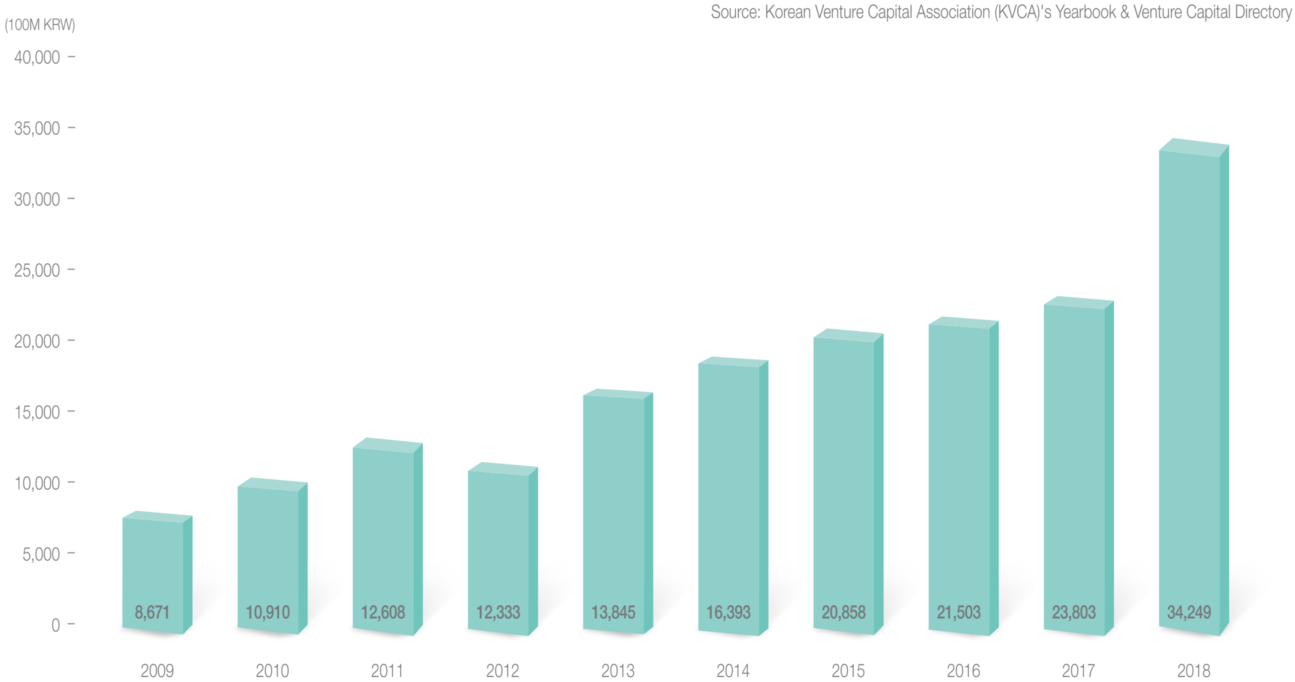
The Ministry of SMEs and Startups unveiled that 2018 saw all-time highs for fundraising, investments, and exits, with KRW 4.7 trillion worth of VC funds created, KRW 3.4 trillion worth of VC invested and KRW 2.7 trillion worth of exits.

VC Investments[2)]

KRW 3,424.9 billion was invested across 1,399 companies throughout 2018. Looking at VC investments by industry, ICT services attracted the most VC totaling KRW 895.7 billion. Biotechnology/healthcare came in second with KRW 841.7 billion. ICT services, biotechnology/healthcare, and distribution/services are the VC market's three hottest investment sectors that are becoming new drivers for economic growth.

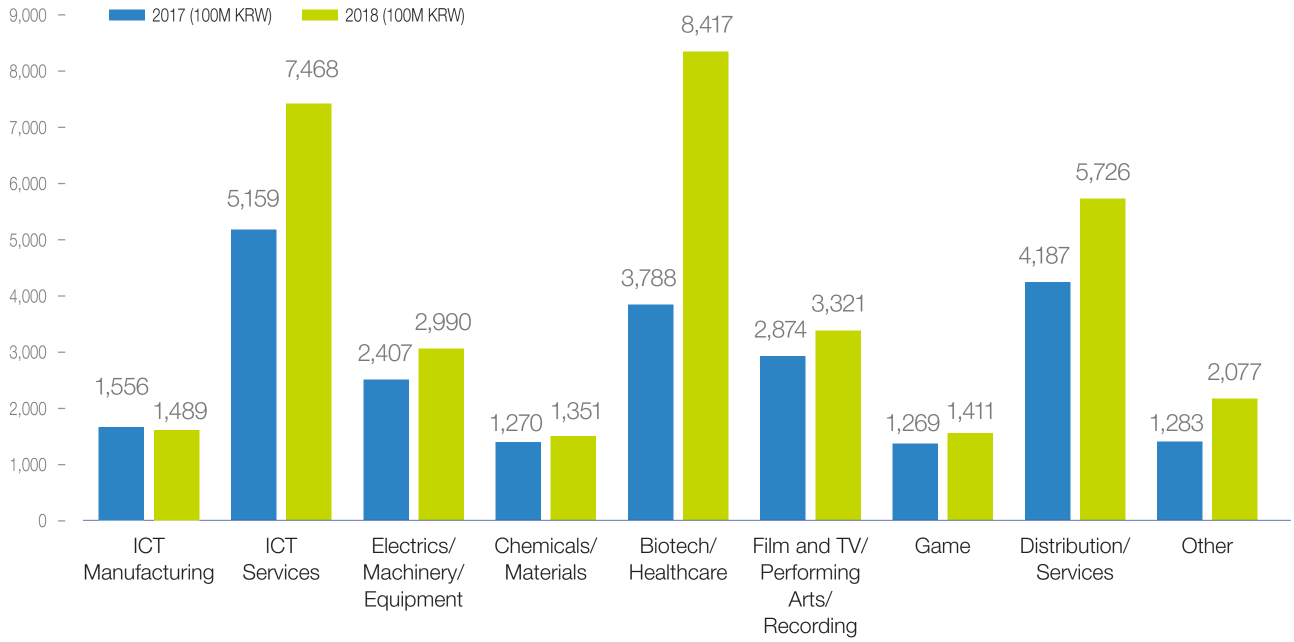
Figure 2 VC Investments by Year

Source: Korean Venture Capital Association (KVCA)'s Yearbook & Venture Capital Directory



2) VCs and VC funds in Korea include VCs and VC funds (small and medium enterprise establishment investment companies, small and medium enterprise establishment investment partnerships, and Korea Venture Funds) under the oversight of the Ministry of SMEs and Startups (MSS), and VCs and VC funds (new technology venture investment companies, and new technology venture investment partnerships) under the oversight of the Financial Services Commission (FSC). MSS-supervised VCs and VC funds made investments totaling KRW 3.4 trillion in 2018 while FSC-supervised new technology VC funds unlocked investments worth KRW 2.5 trillion, according to the Credit Finance Association's press release in March 2019. KVIC MarketWatch only covers MSS-supervised VCs and VC funds.

Figure 3 **2017/2018 VC Investments by Industry**



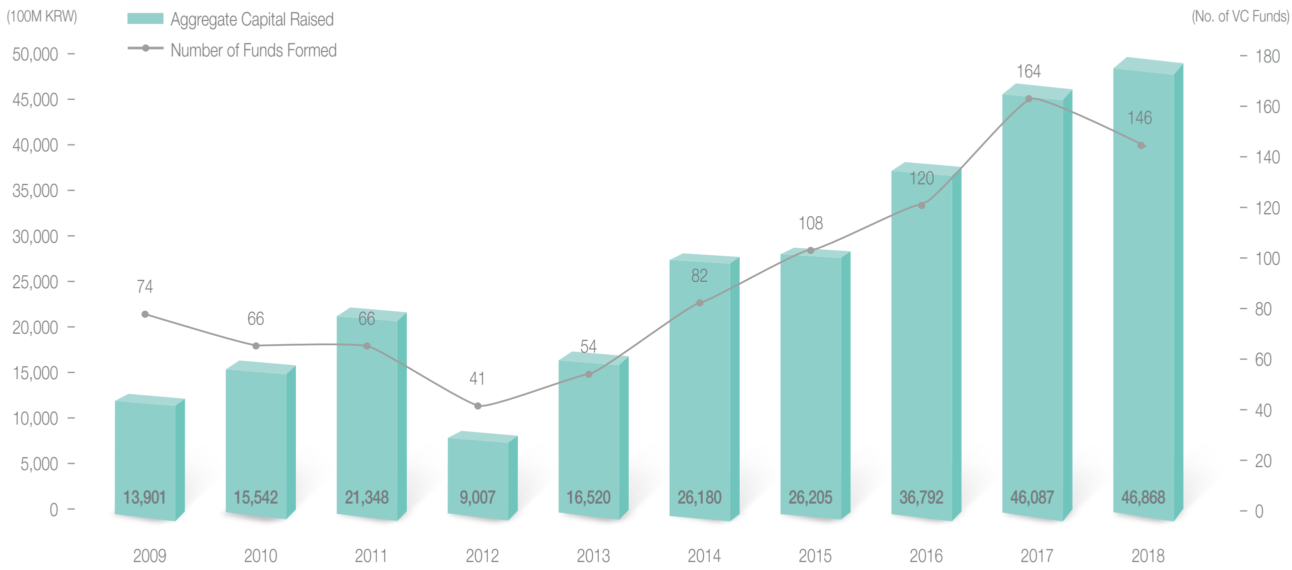
Source: Press releases from the Ministry of SMEs and Startups

Fundraising

2018 saw 146 VC funds closed and raised KRW 4,686.8 billion in aggregate capital, slightly surpassing KRW 4,608.7 billion in 2017 and hitting a new high. The amount of capital committed to the new funds averaged KRW 32.1 billion, up KRW 4 billion from KRW 28.1 billion in 2017. Also, the number of new funds with KRW 100 billion or more in commitments exceeded ten for the first time in Korea, reflecting the global trend of increasing fund sizes with the rise of mega funds.
The number of mega funds has grown from 5 in 2016 to 12 in 2018.

Moreover, SoftBank Ventures Korea has been renamed as SoftBank Ventures Asia in early 2019. SoftBank Ventures Asia said that as the early stage investment vehicle of the SoftBank Group, it will expand its presence globally with an emphasis on Asia. As it is reportedly set to launch a global early stage fund, much attention is being paid to the size of a new fund.

Figure 4 VC Fundraising by Year



Source: KVCA

Table 1 2018 Top 10 VC Investments and VC Fund Status

Firm	VC Investment in 2018 (100M KRW)	Aggregate Fund Size* (100M KRW)	Number of Funds*
Korea Investment Partners	2,121	17,494	34
SoftBank Ventures Asia	1,636	6,728	8
SBI Investment Korea	1,445	6,616	19
Atinum Investment	1,393	7,805	5
Smilegate Investment	1,135	7,386	18
KB Investment	1,094	7,090	16
Intervest	934	7,045	8
KTB Network	872	8,435	15
HB Investment	782	3,519	8
IMM Investment	761	4,955	13

* The number and size of VC funds as of February 2019

Source: KVCA

Exits[3)]

VC funds exited 1,485 companies in 2018, totaling KRW 2,678.0 billion. Exit activity reached new heights in 2018, growing 10% and 49.1% from 1,350 companies and KRW 1,796.5 billion in 2017, respectively. Looking at exits by industry, ICT services, and biotechnology/healthcare were the two industries that stood out among the rest in terms of exits, as in the amount invested.

The value of exits from the game industry in particular increased as Korean VC funds investing in Krafton (previously known as Bluehole), the developer of the global hit "PlayerUnknown's Battle Ground" exited their investments through over-the-counter (OTC) secondary sales.

The graph below allows us to capture changes in the Korean VC market. The proportion of exits in traditional investment sectors such as chemicals/materials, and electrics/machinery/equipment has declined gradually. On the other hand, exit value has grown in new industry sectors such as biotechnology and ICT services the government is nurturing as new growth drivers in the era of the Fourth Industrial Revolution. VCs put out press releases boasting a double-digit internal rate of return (IRR) of liquidated VC funds. Accordingly, the Korean VC market is emerging as an attractive investment destination.

Figure 5 Exits by Year

Source: KVCA

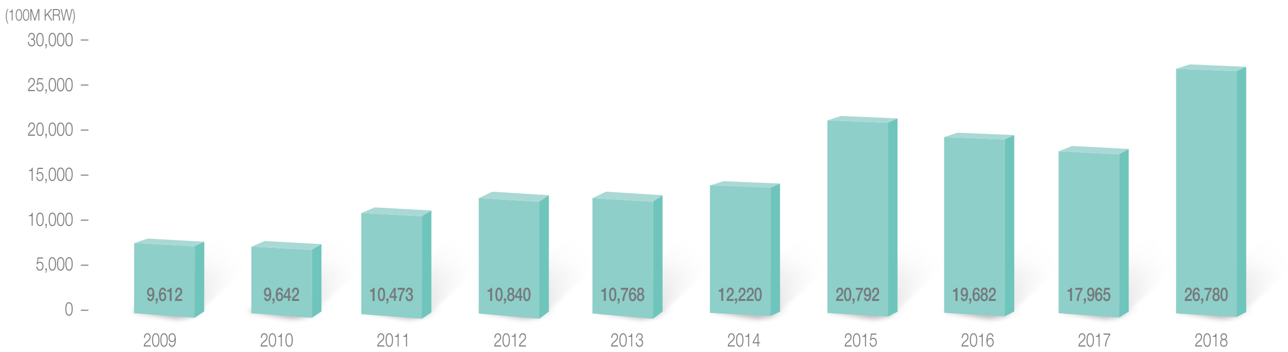
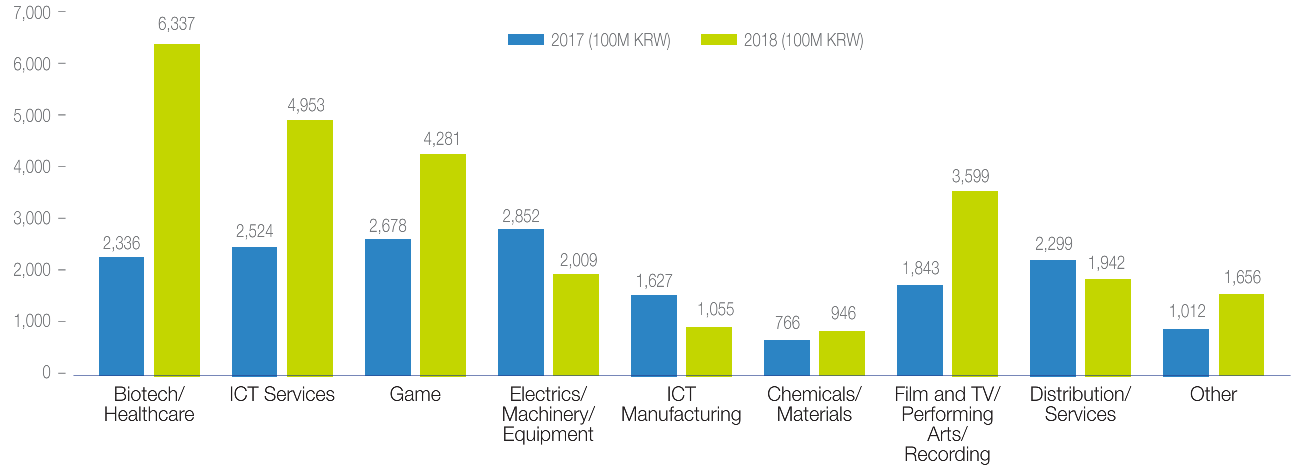


Figure 6 2017 and 2018 Exit Value by Industry

Source: Press releases from the Ministry of SMEs and Startups



3) Aggregate value of VC fund exits in 2018

Strengths of the Korean VC Market

Solid growth supported by the government's strong policy commitment

FAANG (Facebook, Amazon, Apple, Netflix, and Google) in the United States and BAT (Baidu, Alibaba, and Tencent) in China have grown and emerged as the key drivers of economic growth in their countries. The Korean government has been concentrating its policy efforts on building a sustainable startup ecosystem to facilitate the creation and growth of startups which will serve as driving forces for growth and bring vitality to the economy.

It is notable that the government provides entrepreneurial finance to the VC market through Korea Venture Investment Corp. (KVIC) founded in 2005. More specifically, the government has actively taken part in the development of the VC market by pooling its money with private investors to create VC funds and stimulating the startup ecosystem through continuing investments by KVIC, the general partner of the funds. The Korean VC ecosystem is expected to achieve more robust growth than any other VC ecosystems in the world.

High ICT penetration and innovation capability

According to the Global Competitiveness Report 2018 released by the World Economic Forum best known for its annual meeting in Davos, dubbed the "Davos Forum," Korea ranked highest among 140 countries in terms of ICT adoption. That implies that as the vast majority of Koreans use the internet and mobile phones, the markets for game and online to offline (O2O) services are well developed.

Table 2 **ICT Adoption in Korea, 2018**

Index Component	Rank/140
Mobile-cellular telephone subscriptions	52
Mobile-broadband subscriptions	17
Fixed-broadband Internet subscriptions	6
Fibre Internet subscriptions	1
Internet users	9

Source: World Economic Forum, Global Competitiveness Report 2018

Korea ranked 8th in innovation capacity, 2nd in R&D spending, and 3rd in patent applications. It also ranked the second-highest in terms of buyer sophistication,[4] which indicates buying decisions made based more on product attributes than on product price. This suggests that innovative companies in the Korean market have sufficient potential to generate revenue from their own business models.

Table 3 **Innovation Capability, 2018**

Index Component	Rank/140
Diversity of workforce	82
International co-inventions	15
Scientific publications	18
R&D expenditures	2
Buyer sophistication	2
State of cluster development	30
Multi-stakeholder collaboration	31
Patent applications	3
Quality of research institutions	11
Trademark applications	23

Source: World Economic Forum, Global Competitiveness Report 2018

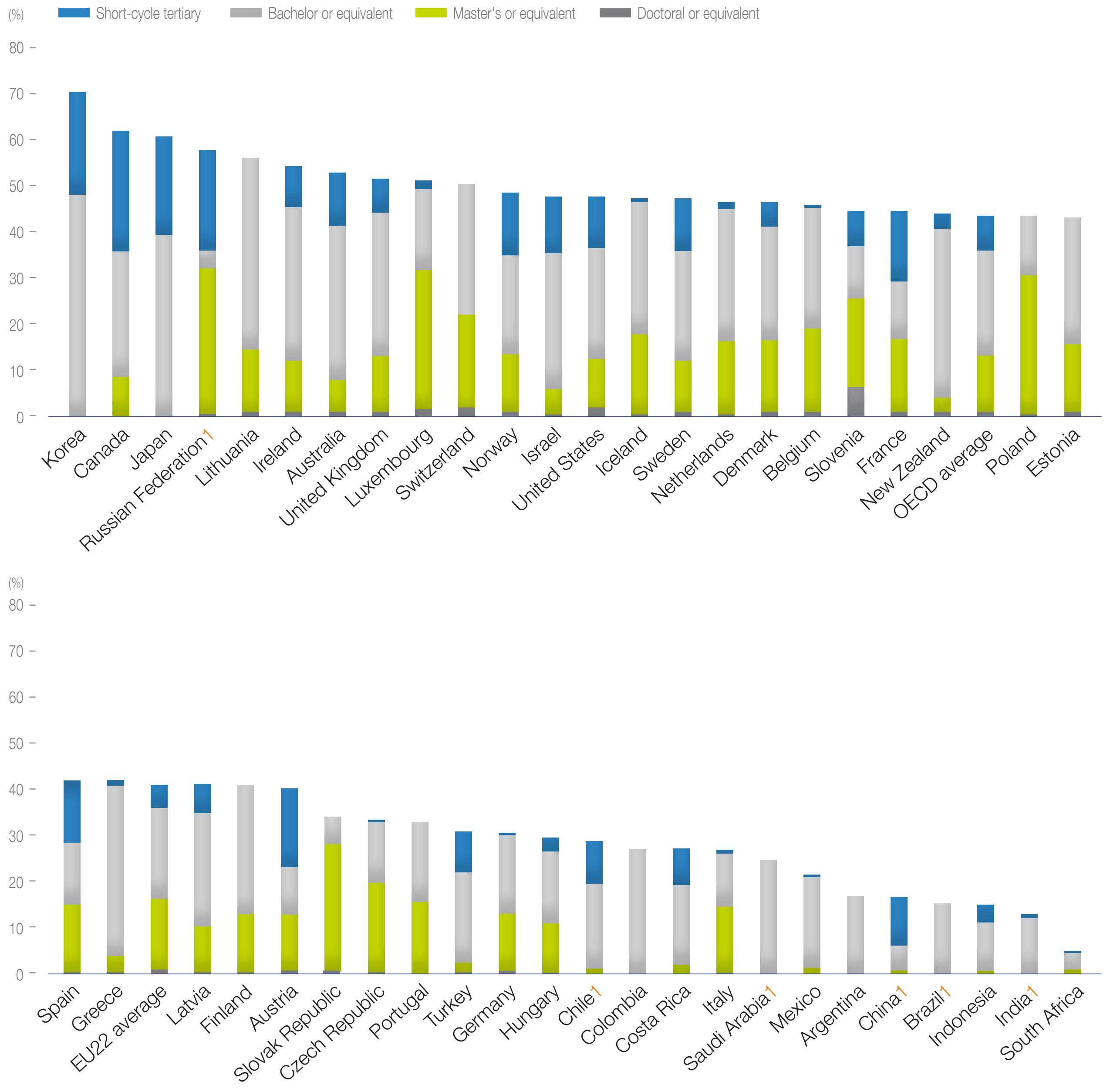
Highly educated and talented workforce

Korea is the country where parents show strong enthusiasm and determination to educate their children, as illustrated by statistics. According to OECD Education at a Glance 2018, Korea took the number one spot among the OECD member states in terms of the share of 25-34 year olds with a tertiary degree. In addition, Korea ranked 11th out of 63 countries in terms of first university science and engineering degrees as a percentage of higher education degrees in the IMD World Competitiveness Yearbook 2018.

What future is ahead for the startup ecosystem in Korea with such highly educated and talented workforce? Global Entrepreneurship Monitor's 2018/2019 Global Report said, “perhaps the closest indicator of entrepreneurial potential in society is the extent to which people intend to start a business in the future. Entrepreneurial intentions represent the percentage of working adults (ages 18-64) who state they intend to start a business in the next three years.” Korea ranked 13th among 48 economies in terms of entrepreneurial intentions, indicating a promising outlook for its startup ecosystem in coming years.

4) Response to the survey question “In your country, on what basis do buyers make purchasing decisions?” [1 = based solely on the lowest price; 7 = based on sophisticated performance attributes] | 2017–2018 weighted average or most recent period available (source: World Economic Forum, Executive Opinion Survey)

Figure 7 Percentage of 25-34 Year-olds with Tertiary Education, by Level of Tertiary Education (2017)



1. Year of reference differs from 2017

Source: OECD (2018), Education at a Glance Database

Regulatory innovation for the VC exit market

The most commonly used exit route in the Korean VC market is exit through an initial public offering (IPO), i.e., selling a stake in an investee company through an IPO. Hence, policy makers have put various policies in place to build a virtuous cycle in the VC ecosystem in which VC-backed companies grow and exit via an IPO, and proceeds from exits are reinvested in promising startups.

Figure 8 **Korean Stock Exchanges and Target Companies**

KONEX
Early-stage startups with high growth potential

↓

KOSDAQ
Robust, high growth SMEs

↓

KOSPI
Healthy larger companies

The KOSDAQ stock market, which is the Korean equivalent to the NASDAQ market, has grown in market capitalization faster than the KOSPI market and the real estate market over the past five years from 2012 to 2016 according to the government's press release published in January 2018. The government has reformed the KOSDAQ market's governance, financial and tax support, and listing standards with the policy intent to strengthen the business growth ladder, which consists of three stages or rungs (the OTC market, KONEX, and KOSDAQ). Particularly worth noting is the overhaul of the requirements for listing on the KOSDAQ market in April 2018. Pre-tax income was added as a new listing threshold for companies that generate profits, and admission standards were eased to allow companies that do not generate any profit to get listed on KOSDAQ if they meet either market value or equity capital requirements. The overhaul has significantly broadened the scope of potential targets for admission to trading on the stock market. Furthermore, it enables early-stage startups and companies in need of large capex investment to raise growth capital through an IPO. In such environment, companies with strong growth potential will grow, and VC funds will exit their investments in those companies and reinvest in new startups. This will make the VC ecosystem thrive.

Table 4 KOSDAQ Listing Requirements
(based on the amended listing rules adopted on April 17, 2019)

Type of Company	General Company (including venture company)		Growth Technology Company*	
	Profits and revenue	Market value and growth potential	Technology evaluation	Recommendation on growth potential
Share distribution	The applicant must meet one of the following requirements: 1. A minimum of 500 minority shareholders, at least 25% of shares held by minority shareholders, and at least 5% of shares to be publicly offered after the submission of application for listing eligibility review (if minority shareholders hold less than 25% of shares, at least 10% of shares should be publicly offered); 2. Equity capital of at least KRW 500 billion, a minimum of 500 minority shareholders, and at least 10% of shares to be publicly offered after the submission of application for listing eligibility review plus higher than a certain number of shares by size of capital or market value; or 3. At least 25% shares to be publicly offered, and at least 500 minority shareholders			
Business performance, market value, etc.	1. Pre-tax income from continuing operations of KRW 2 billion (KRW 1 billion for venture companies), and market value of KRW 9 billion; 2. Pre-tax income from continuing operations of KRW 2 billion (KRW 1 billion for venture companies), and equity capital of KRW 3 billion (KRW 1.5 billion for venture companies); 3. Positive pre-tax income from continuing operations, market value of KRW 20 billion, and revenue of KRW 10 billion (KRW 5 billion for venture companies); or 4. Pre-tax income from continuing operations of KRW 5 billion	1. Market value of KRW 50 billion, revenue of KRW 3 billion, and average annual growth of at least 20% over the past two consecutive years; 2. Market value of KRW 30 billion, and revenue of KRW 10 billion (KRW 5 billion for venture companies); 3. Market value of KRW 50 billion, and the price to book ratio (PBR) of 200%; 4. Market value of KRW 100 billion; or 5. Equity capital of KRW 25 billion	1. Equity capital of KRW 1 billion 2. Market value of KRW 9 billion A company is rated A or higher in terms of technology and other factors by providers of professional appraisal services.	A SME should be recommended by its lead manager based on the assessment of the company's growth potential.
Auditor's opinion	Unqualified opinion on the financial statements of the latest fiscal years			
Transparency (corporate governance)	The applicant must meet requirements for outside directors and auditors			
Other requirements	No restriction on the transfers of shares, etc.			
Qualitative requirements	A company's growth potential, continuity, transparency and stability, investor protection measures, the KOSDAQ market's sound development, industrial characteristics, job creation impact and contribution to the economy are taken into account.			

* Growth Technology Company refers to a company that has received a rating of at least BBB or A in technology capabilities by multiple professional appraisal agencies.

Source: Korea Exchange (KRX)

Korea also has the SME market called Korea New Exchange (KONEX), modeled after the UK Alternative Investment Market (AIM). The new market was launched in July 2013 to create a virtuous cycle of the ecosystem for SMEs and startups through more vibrant exits and reinvestments. KONEX is a platform that facilitates early-stage SME access to capital market financing, and supports the exits of VCs, angels, and entrepreneurial capital from investee companies prior to their listing on KOSDAQ. Accordingly, KONEX is a less regulated market than KOSDAQ or KOSPI, featuring least stringent admission criteria, and more relaxed accounting, corporate governance and disclosure requirements. Furthermore, access to the market is limited to professional investors with risk tolerance.

KONEX also reduced barriers to market entry by adopting the designated advisor system under which a designated advisor assists companies in listing their shares on the market and making disclosures. In early 2019, the government has come up with additional policy measures for the KONEX market, exhibiting its strong commitment to facilitating the market and achieving the primary objectives of the KONEX launch. Taken them altogether, exit activity in the KONEX market is forecast to pick up steam.

For all figures in the article, the following conversion can be used for reference: USD 1=KRW 1,100.

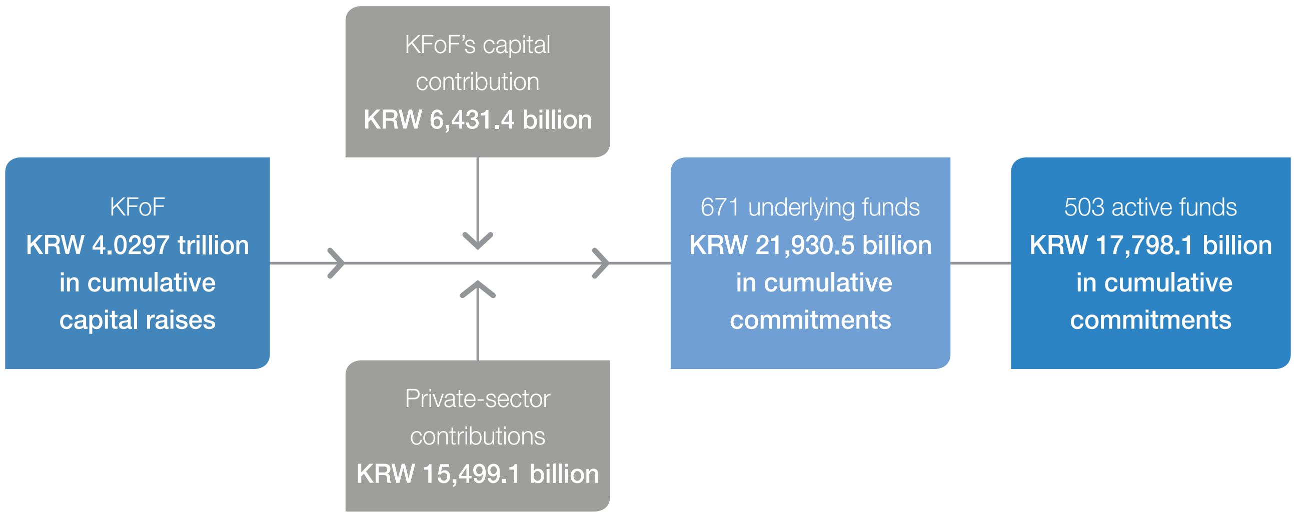
2H2018 Korea Fund of Funds:

Trends in Fundraising, Investments and Exits

Overview of Korea Fund of Funds

Korea Fund of Funds (KFoF) has secured KRW 4,029.7 billion in cumulative capital commitments as of December 31, 2018. KFoF has so far set up a total of 671 venture capital (VC) funds worth KRW 21,930.5 billion on a cumulative basis, including KRW 15,499.1 billion raised from private-sector investors. 503 of the KFoF underlying funds are currently active with KRW 17,798.1 billion in assets under management (AUM). Since its inception, KFoF has invested KRW 15,108.9 billion in 5,243 companies through its 671 underlying funds.

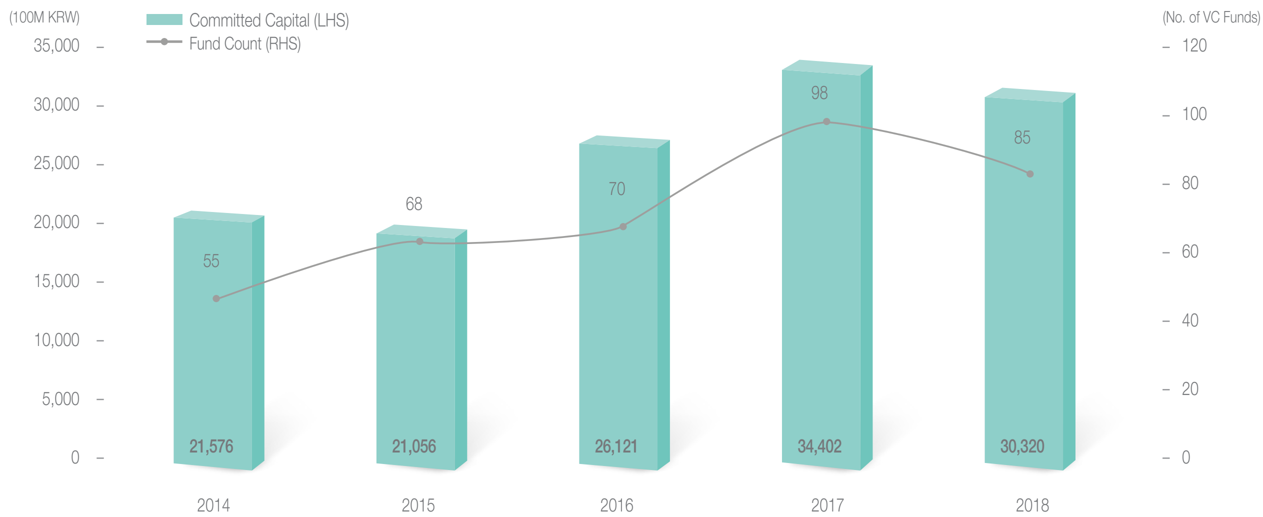
Figure 1 **KFoF at a Glance**



Fundraising

Overall, the number of new VC funds created by KFoF and the total amount of capital committed to the funds have increased over the last five years, hitting record highs in 2017 with 98 funds and KRW 3,440.2 billion in aggregate committed capital.

Figure 2 5-year Trends in Fund Formation by KFoF



Source: KVIC

Investments

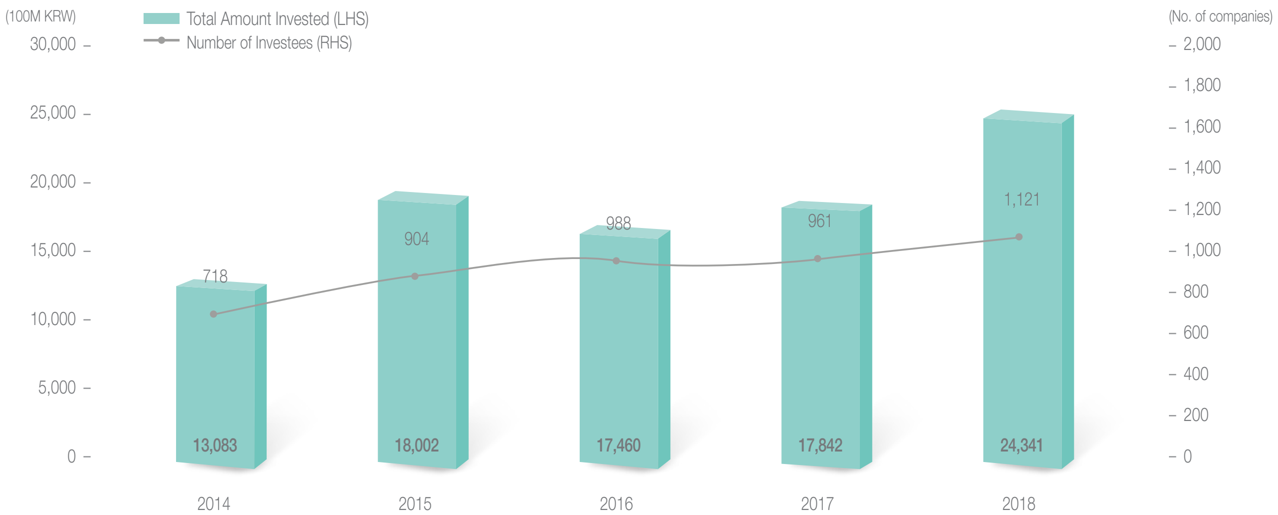
Investments by KFoF Underlying Funds

In 2018, 320 of the VC funds financed by KFoF invested a total of KRW 2,434.1 billion in 1,121 companies. The amount invested and the number of investee companies rose 36.4% and 16.6% year over year (YoY), respectively, to record highs.

Top-Ranked Investee Companies and Investment Sectors

When looking at top 10 companies as measured by the amount invested by the KFoF underlying funds in 2018, the average investment per company was KRW 16.93 billion. Meantime, for all the investee companies, an average of KRW 2.17 billion was invested per company. By investment sectors, 19.9% (KRW 483.8 billion) of the total capital invested by KFoF underlying funds went to medical materials/pharmaceuticals, 13.6% (KRW 331.4 billion) to software, 8.1% (KRW 196.7 billion) to wholesale and retail trade, 7.5% (KRW 181.5 billion) to information services, and 7.3% (KRW 178.1 billion) to audiovisual content (including investment in projects).

Figure 3 5-year Trends in Investments by KFoF Underlying Funds



* As of December 31, 2018

** The number of investee companies above excludes overlapping companies.

Source: KVIC

Deals by Stage (January to December 2018)

If we take a look at deal value by stage in 2018, the KFoF underlying funds deployed KRW 900.2 billion in expansion-stage companies (3-7 years old), accounting for 37.0% of the total VC deals, KRW 795.1 billion (32.7%) in later-stage companies (more than 7 years old), and KRW 738.8 billion (30.4%) in early-stage companies (less than 3 years old). Meantime, when breaking down the number of investees by stage, early-stage, expansion-stage and later-stage companies represented 41.5%, 34.7%, and 23.8% of the total investees, respectively.

Deals by Industry (January to December 2018)

By industry, biotechnology/healthcare attracted KRW 576 billion in fresh funding from the underlying funds of KFoF, taking up the largest share (23.7%) of the total investments in 2018. ICT services came in second with KRW 516.3 billion (21.2%), followed by distribution/services with KRW 401.2 billion (16.5%). In terms of the number of investees, ICT services was the most popular industry, accounting 22.3% of all the investee companies, followed by distribution/services (17.9%), and biotechnology/healthcare (16.3%).

Figure 4 2018 Deal Activity by Stage-KFoF Underlying Funds

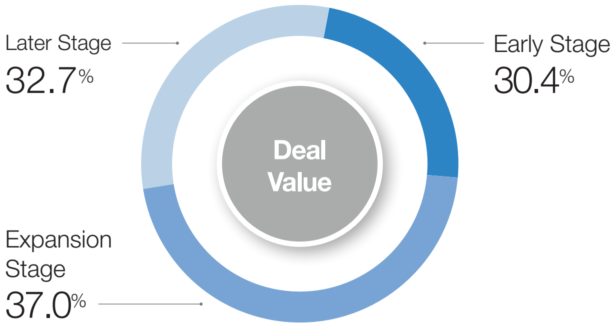


Figure 5 2018 Deal Activity by Industry-KFoF Underlying Funds

No	Sector	% of Total
1	Biotech/Healthcare	**23.7**
2	ICT Services	**21.2**
3	Distribution/Services	**16.5**
4	Film and TV/Performing Arts/Recording	**9.2**
5	Electrics/Machinery/Equipment	**8.2**
6	Other	**7.1**
7	Game	**4.9**
8	ICT Manufacturing	**4.8**
9	Chemicals/Materials	**4.4**

No	Sector	% of Total
1	ICT Services	**22.3**
2	Distribution/Services	**17.9**
3	Biotech/Healthcare	**16.3**
4	Film and TV/Performing Arts/Recording	**14.0**
5	Electrics/Machinery/Equipment	**9.3**
6	Other	**6.0**
7	ICT Manufacturing	**5.3**
8	Game	**5.0**
9	Chemicals/Materials	**4.3**

Source: KVIC

Exits

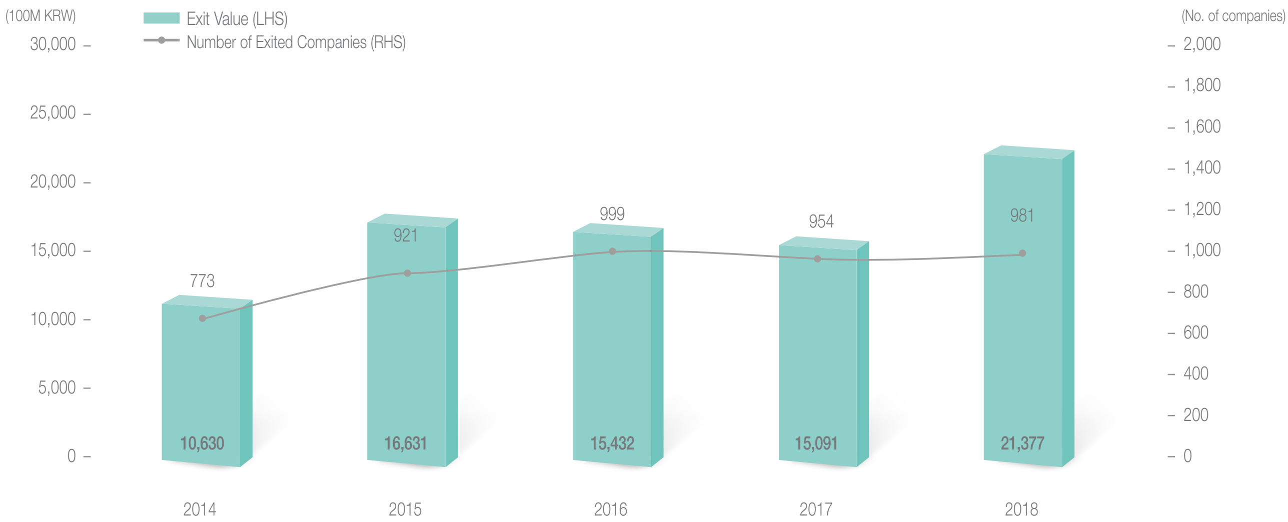
Exits by KFoF Underlying Funds

Throughout 2018, 331 KFoF underlying funds exited 981 companies, collectively garnering KRW 2,137.7 billion (KRW 837 billion in initial investments and KRW 1,300.7 billion in returns), and generating a gross return multiple of 2.6x.
The exit value and the number of companies exited increased 41.7% and 2.8% YoY, respectively, reaching all-time highs, as in investments.

Exit Value and Exits by Industry

Of all the exits in 2018, the largest exit stood at KRW 384.0 billion, delivering a 35.8x return.
When breaking down exits by industry, medical materials/pharmaceuticals constituted 20.4% (KRW 435.8 billion) of the total, game software 20.1% (KRW 428.6 billion), software 9.6% (KRW 205.6 billion), performing arts/exhibition/music 8.8% (KRW 189.1 billion), and information services 7.2% (KRW 153.5 billion).

Figure 6 5-year Exit Trends



* As of December 31, 2018

Source: KVIC

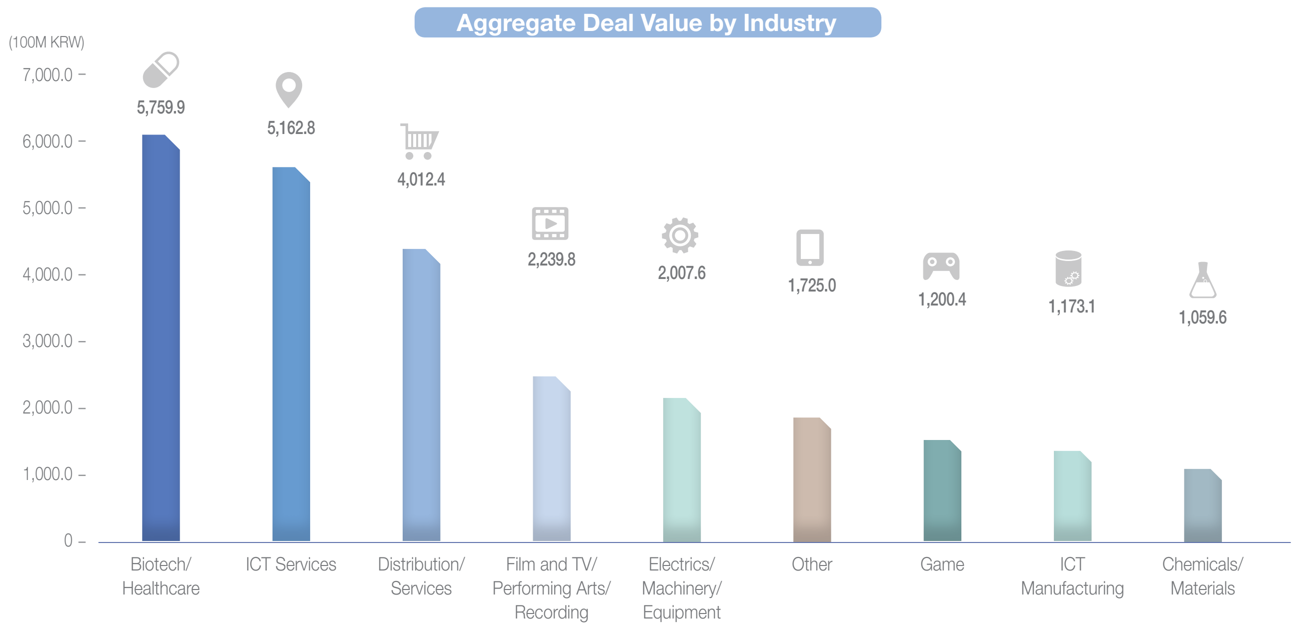
2018 KFoF
Investments by Industry

2018 KFoF Investments by Industry

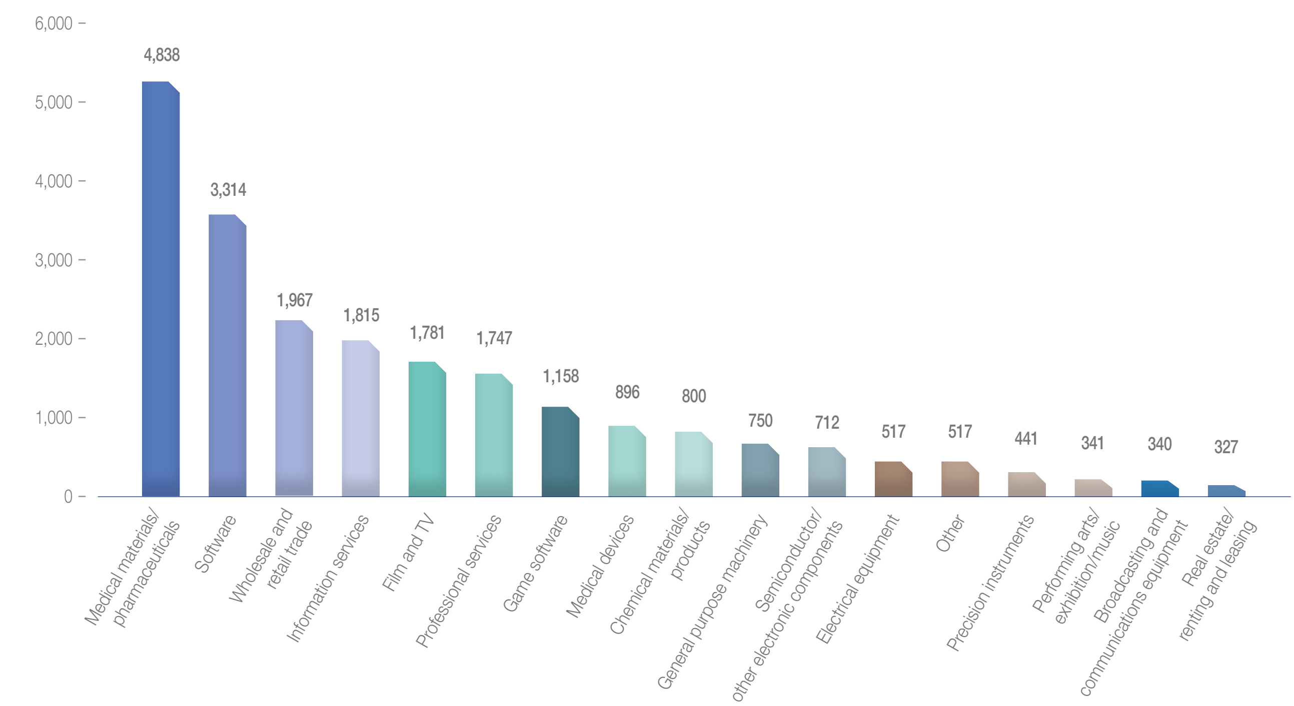
2018 was a record year for VC investments by the underlying funds of Korea Fund of Funds (KFoF), with KRW 2,434.1 billion (up by 36.4% year over year or YoY) invested across 1,121 companies and projects (up by 16.6% YoY), representing 16.1% of the cumulative total capital invested since the KFoF inception in 2005.

Average investment per company stood at KRW 2.17 billion, exhibiting a YoY increase driven by the growth in total VC investments. This is higher than the average investment per company (KRW 1.86 billion) in 2017.

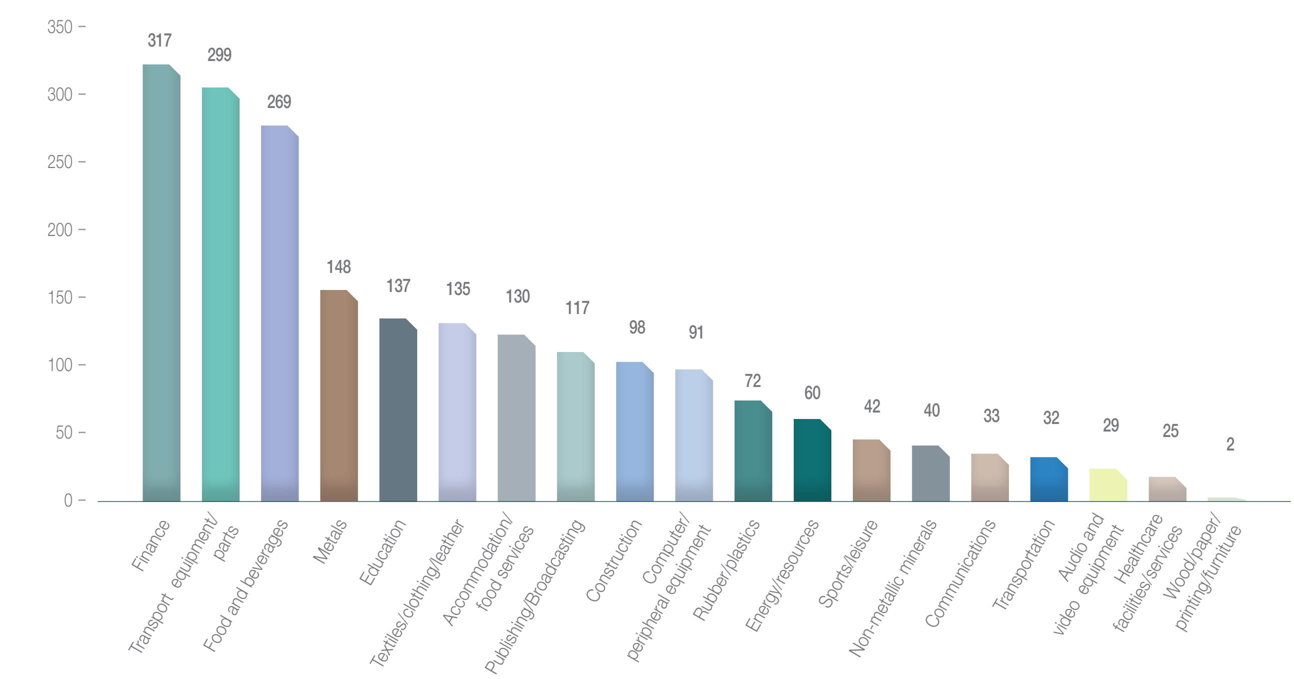
Figure 1 2018 KFoF Investment Activity by Industry and by Sub-Industry



Aggregate Deal Value by Sub-industry



Aggregate Deal Value by Sub-industry



Source: KVIC

In terms of investment amount and investment growth rate, the hottest industries for VC investment were biotechnology/healthcare (KRW 576 billion, up by 80.2% YoY), ICT services (KRW 516.3 billion, up by 28.6% YoY), and distribution/services (KRW 401.2 billion, up by 17.7% YoY). Over the past five years, these three industries have been strong in the Korean VC market. This trend will likely continue into 2019.

The number of companies with KRW 10 billion or more in aggregate funding from the KFoF underlying funds throughout the year increased to 29 in 2018, compared with 7 in 2017. 12 of them are involved in biotechnology/healthcare. The biggest funding recipient was an office sharing and consulting company.

Table 1 shows that medical materials/pharmaceuticals, which is one sub-industry of biotechnology/healthcare, registered the biggest increase in funding (up KRW 227 billion or 88.4% YoY). Compared to 2017 with an average of KRW 2.92 billion invested across 88 companies working in medical materials/pharmaceuticals, 2018 experienced increases in the number of portfolio companies and the average size of investments in the same sub-industry. It was then followed by software within ICT services (up KRW 80.4 billion or 32.0% YoY), and professional services within distribution/services (up KRW 48 billion or 37.9% YoY).

A close look at investment growth by sub-industry suggests that accommodation/food services within the distribution/services industry enjoyed the highest rise in 2018 with over KRW 5 billion invested in each of a coffee franchise operator and a multi-cultural space provider, as compared to KRW 700 million invested in one company in 2017. KFoF investment in accommodation/food services through its underlying funds skyrocketed by 1,760% YoY.

ICT services and software were the most popular sectors for KFoF investments in 2018 as measured by the number of portfolio companies. The average amount invested was the highest in real estate, and renting and leasing within other industries. As the shared office space operator secured large-scale funding, this led to a marked increase in the average amount invested in the sub-industry that the company belongs to.

Table 1 **2018 KFoF Investment Activity**

(100M KRW)

	2018	2017	YoY	Number of portfolio companies	Average amount invested
Total	24,340.6	17,841.5	36.4%	1,121	21.7
Biotech/Healthcare	5,759.9	3,195.6	80.2%	197	29.2
Medical devices	896.4	600.8	49.2%	49	18.3
Healthcare facilities/services	25.0	26.8	-6.8%	2	12.5
Medical materials/pharmaceuticals	4,838.5	2,568.0	88.4%	150	32.3
ICT Services	5,162.8	4,015.2	28.6%	269	19.2
Software	3,314.1	2,509.9	32.0%	181	18.3
Information services	1,815.3	1,473.3	23.2%	110	16.5
Communications	33.4	31.9	4.6%	3	11.1

	2018	2017	YoY	Number of portfolio companies	Average amount invested
Distribution/Services	4,012.4	3,408.7	17.7%	216	18.6
Education	136.8	33.7	306.0%	15	9.1
Wholesale and retail trade	1,966.7	1,877.7	4.7%	114	17.3
Accommodation/food services	130.2	7.0	1760.0%	4	32.6
Transportation	31.5	223.3	-85.9%	4	7.9
Professional services	1,747.3	1,267.1	37.9%	84	20.8
Film and TV/Performing Arts/Recording	2,239.8	2,049.5	9.3%	169	13.3
Performing arts/exhibition/music	341.4	399.3	-14.5%	27	12.6
Audiovisual content	1,781.3	1,604.2	11.0%	136	13.1
Publishing/broadcasting	117.2	45.9	155.3%	7	16.7
Electrics/Machinery/Equipment	2,007.6	1,560.3	28.7%	112	17.9
Transport equipment/parts	299.4	315.6	-5.1%	15	20.0
General purpose machinery	750.2	620.2	21.0%	48	15.6
Electrical equipment	517.3	335.9	54.0%	35	14.8
Precision instruments	440.7	288.6	52.7%	22	20.0
Other	1,725.0	997.3	73.0%	72	24.0
Construction	98.0	13.1	647.6%	3	32.7
Finance	317.1	314.9	0.7%	8	39.6
Other	516.6	260.0	98.7%	26	19.9
Wood/paper/printing/furniture	2.0	30.0	-93.3%	1	2.0
Real estate/renting and leasing	327.0	80.0	308.7%	7	46.7
Textiles/clothing/leather	135.0	159.0	-15.1%	10	13.5
Energy/resources	60.0	15.9	277.4%	2	30.0
Food and beverages	269.3	124.4	116.5%	17	15.8
Game	1,200.4	1,073.9	11.8%	60	20.0
Game software	1,157.9	1,055.4	9.7%	55	21.1
Sports/leisure	42.5	18.5	129.7%	5	8.5
ICT Manufacturing	1,173.1	880.1	33.3%	64	18.3
Semiconductor/other electronic components	712.5	665.0	7.1%	38	18.8
Audio and video equipment	29.0	19.7	47.2%	4	7.3
Computer/peripheral equipment	91.5	140.1	-34.7%	3	30.5
Broadcasting and communications equipment	340.1	55.3	515.0%	20	17.0
Chemicals/Materials	1,059.6	660.9	60.3%	51	20.8
Rubber/plastics	72.0	15.0	380.0%	6	12.0
Metals	147.8	33.9	335.4%	7	21.1
Non-metallic minerals	40.0	96.5	-58.6%	3	13.3
Chemical materials/products	799.8	515.4	55.2%	36	22.2

Source: KVIC

Table 2 lists the hashtags describing the features of a product or service developed, produced or provided by the portfolio companies receiving KRW 5 billion or more in funding in 2018. It aims to help readers better understand the characteristics of portfolio companies in the KFoF underlying funds.

Table 2 **Hashtags for Portfolio Companies with Over KRW 5 billion in VC funding in 2018**

Biotech/Healthcare	#CRISPR Gene Editing #Therapeutic Antibodies #Cancer Immunotherapies #New Biologics Development #Parkinson's Disease Medications #Dry Eye Medications #Bispecific Antibodies #Carbapenem #Mammalian Cell Line Development #Peptide Drugs #Cephalosporins #Companion Diagnostics #Dermal Filler Development #Stem Cell Drugs #Antiepileptic Drugs #Radiopharmaceuticals #Xenotransplantation #Genetic Testing #Glaucoma Medications #Drug Delivery Technologies #Hyaluronic Acid Dermal Fillers #Point-of-care Testing Segment #Dementia Medications #CAR-T #Antirheumatic Drugs #Biosensor #Virus Detection Kit #Drugs to Treat Diabetic Retinopathy
ICT Services	#Healthcare ICT Solutions #Electronic Payments Solution #Software Solution #Education Platform for Kids #Anonymous Social Networking Apps #e-commerce #Database Management System (DBMS) #Personal Wealth Management Apps #e-Commerce Trading Platform #Platform for Receiving and Comparing Interior Design Quotes #Mobile Point of Sale (POS) #Interior Design Mobile Platform #Movie Recommendation Service #Wedding Marketplace Platform #Used Car Platform #Online Platform for Second-hand Sales and Purchases #Sports Content Analysis #e-Sports Data Feed Service #AI-based Diagnostic Medical Imaging Equipment #Big Data Visualization #Smartphone Apps for Video Content Distribution #Weight Loss Apps #Audio Streaming Service #e-book Subscription Platform
Distribution /Services	#Subtitling Services for Content #Shared Office Space #Coffee Franchise #Moving Information Service #Multi-Purpose Cultural Space Development #Fashion and Beauty_ e-Commerce #Mobile Commerce #Food e-Commerce Platform #Intellectual Property Consulting #Indoor Zoo #Fashion and Style Apps #Interim Waste Treatment
Film and TV/ Performing Arts/ Recording	#Animation Production #Film Production #Comic Book Production #Licensed Merchandising #Broadcasting Content Production
Electrics/Machinery/ Equipment	#Oil Tanker #Electron Microscope #Cylinder Liner in Marine Diesel Engine #Secondary Cells_ Cell Formation #Secondary Cells_Manufacturing Facilities #Submarine Systems & Equipment #Semiconductor Manufacturing Equipment #Augmented Reality (AR) Contact Lens
Other	#Heavy Industries #Blood Components #Fuel Made From Sewage Sludge #Social Trading #Shared Kitchen
Game	#Online Game #Mobile Ads Platform #Radio Content Platform #Console Game #Mobile Game
ICT Manufacturing	#AI Hardware #SiC-GaN Semiconductor Transistor #High-Efficiency Power Amplifier #Microdisplay #Industrial PDA
Chemicals/ Materials	#Cosmetics Marketing #Cosmetic Ingredients #Cosmetics ODM #Silver Components #Cutting Edge Chemicals

Source: KVIC

For all figures in the article, the following conversion can be used for reference: USD 1=KRW 1,100.

Analysis of

Unicorns and Unicorn Candidates in Korea

This report provides an analysis of portfolio companies with high valuations in KFoF underlying funds with a particular focus on company characteristics.
This issue of KVIC MarketWatch offers a glimpse into unlisted portfolio companies valued at over KRW 200 billion as of December 31, 2018.

Introduction

A unicorn is an imaginary creature depicted as a horse with a single horn in the middle of the forehead. What is a unicorn in the business world? The term was first used in 2013 by Aileen Lee, founder of Cowboy Ventures, a venture capital firm in the United States. Currently, the term “unicorn” is often used to describe an unlisted or private company with a value of over USD 1 billion.

According to the Global Unicorn Club report published by CB Insights, a US-based market research firm, there were 361 unicorn companies around the world, with a collective worth of nearly USD 1,124.8 billion as of June 12, 2019. Korea has eight of them, including Viva Republica (Toss), Yanolja, L&P Cosmetics, Yello Mobile, Woowa Brothers, Wemakeprice, Coupang, and Krafton (formerly Bluehole).

Amid growing global attention to unicorns, KVIC MarketWatch began featuring unicorns and unicorn candidates among portfolio companies in the underlying funds of Korea Fund of Funds (KFoF) on a semiannual basis. This is the second in its series for the Korean edition of our MarketWatch, but the first for the international edition.

In this report, we have analyzed the characteristics of 31 unlisted portfolio companies valued at over KRW 200 billion as of December 31, 2018, which are classified into unicorns and unicorn candidates, with a focus on valuation, funding amount, industry, company age, and revenue.

Valuation

The aggregate valuation of unicorns and unicorn candidates rose by 3.1% half on half (HoH), whereas the average and median valuations of the companies dropped HoH in all of the valuation ranges. The 31 unicorns and unicorn candidates were worth a total of KRW 19,975.7 billion. Their average and median values were KRW 644.4 billion and KRW 312.4 billion, respectively. When dividing the companies into three groups by valuation, the average and median values for five companies valued above KRW 1 trillion as of December 31, 2018 were approximately KRW 2.09 trillion and KRW 1.4 trillion, respectively. The average and median values for five companies with valuation between KRW 500 billion and KRW 1 trillion stood at KRW 678.3 billion and KRW 609.4 billion, respectively. The average and median values for 21 companies valued between KRW 200 billion and KRW 500 billion were nearly KRW 292.4 billion and KRW 247.5 billion, respectively.

The total number of the portfolio companies classified as unicorns and unicorn candidates in our analysis edged up by 3 HoH from 28 to 31. The number of companies valued at KRW 1 trillion or more rose by 2 from 3 to 5. It is noteworthy that eight newcomers were added to the group of companies with a value between KRW 200 billion and KRW 300 billion, showing the largest increase from 7 to 15.

Table 1 **Valuation Distribution**

Valuation Range	Number of Companies (▲ indicates a HoH increase, ▼ indicates a HoH decrease)		
KRW 1 trillion or more	5(▲2)		
		Valuation Range	Number of Companies
KRW 500 billion - KRW 1 trillion	5 (▼3)	KRW 900 bn - KRW 1 tn	0 (▼2)
		KRW 800 bn – KRW 900 bn	2 (▲1)
		KRW 700 bn – KRW 800 bn	0 (▼2)
		KRW 600 bn – KRW 700 bn	1 (–)
		KRW 500 bn – KRW 600 bn	2 (–)
KRW 200 billion - KRW 500 billion	21 (▲4)	KRW 400 bn – KRW 500 bn	4 (▼1)
		KRW 300 bn – KRW 400 bn	2 (▼3)
		KRW 200 bn – KRW 300 bn	15 (▲8)
Total	**31** (▲3)		

Source: KVIC

Table 2 **Total, Average and Median Valuations**

(100M KRW)

Valuation Range	Total Valuation	Average Valuation	Median Valuation
KRW 1 trillion or more	104,431.6 (38.6% HoH)	20,886.3 (-16.8% HoH)	13,957.3 (-0.3% HoH)
KRW 500 billion – KRW 1 trillion	33,915.4 (-44.8% HoH)	6,783.1 (-11.7% HoH)	6,093.7 (-23.0% HoH)
KRW 200 billion – KRW 500 billion	61,409.6 (7.7% HoH)	2,924.3 (-12.8% HoH)	2,475.0 (-27.1% HoH)
Total	199,756.5 **(3.1% HoH)**	6,443.8 **(-6.9% HoH)**	3,124.0 **(-30.9% HoH)**

Source: KVIC

Funding Amount

Until May 31, 2019, the 31 unicorns and unicorn candidates have received a total of KRW 416.5 billion in funding from the underlying funds of KFoF and other FoFs managed by KVIC. The average investment deal per company was about KRW 13.4 billion.

By valuation range, the average and median deal sizes were KRW 18.8 billion and KRW 10 billion for companies worth KRW 1 trillion or more, KRW 10.2 billion and KRW 10.2 billion for those worth between KRW 500 billion and KRW 1 trillion, KRW 12.9 billion and KRW 6.5 billion for those worth between KRW 200 billion and KRW 500 billion, respectively.

The average and median deal sizes for companies with valuation between KRW 200 billion and KRW 500 billion dropped. That is because the large number of relatively less funded newcomers were added to the list of companies valued between KRW 200 billion and KRW 300 billion, bringing the total number of companies in this range from 7 to 15. Moreover, in the valuation range of KRW 1 trillion or more, the addition of two new unicorns diluted the impact of one outlier company in terms of valuation and funding amount, leading to a HoH decline in the average deal size.

Furthermore, the average deal size for companies without the outlier in the KRW 1 trillion or more range is lower than that in the KRW 500 billion - 1 trillion range, exhibiting reversals in average or median valuation and funding amount between companies in the two valuation ranges.

Table 3 **Total, Average and Median Deal Sizes**

(100M KRW)

Valuation Range	Total Deal Value	Average Deal Value	Median Deal Value
KRW 1 trillion or more	940.0 (25.3% HoH)	188.0 (-24.8% HoH)	100.0 (0.0% HoH)
KRW 500 billion – KRW 1 trillion	509.1 (-25.6% HoH)	101.8 (18.4% HoH)	102.0 (12.1% HoH)
KRW 200 billion – KRW 500 billion	2,715.7 (10.8% HoH)	129.3 (-10.2% HoH)	65.0 (-23.5% HoH)
Total	4,164.8 **(7.2% HoH)**	134.3 **(-3.3% HoH)**	84.7 **(-13.5% HoH)**

Source: KVIC

Industry

According to KVIC Industry Classification, we have broken down the portfolio companies by industry and sub-industry. ICT services, and distribution/services produced 35.5% (11) and 19.4% (6) of the 31 unicorns and unicorn candidates, followed by biotechnology/healthcare (5), game (4), chemicals/materials (3), film and TV/performing arts/recording (1), and other (1).

Our HoH analysis has found the greater concentration of unicorns and unicorn candidates in fewer industries, with the 31 most valuable companies spread across seven industries, as compared to the 28 companies across nine industries, including ICT manufacturing, and electrics/machinery/equipment in the previous analysis.
Breaking down unicorns and unicorn candidates by sub-industry, we have found eight companies in software, five in wholesale and retail trade, four each in medical materials/pharmaceuticals, and game software, and three each in information services, and chemical materials/products.

Much like the industry distribution, unicorn and unicorn candidates are also more concentrated into fewer sub-industries, with the 31 companies in 10 sub-industries. In contrast, our preceding HoH analysis revealed the rise of 28 unicorns and unicorn candidates from 15 sub-industries, such as education (within distribution/services), audiovisual content (within film and TV/performing arts/recording), semiconductor/other electronic components (within ICT manufacturing), general purpose machinery (within electrics/machinery/equipment), and other sub-industries (within other industries).

Table 4 **Industry Distribution According to KVIC Industry Classification**

Industry Classification	Number of Companies (▲ indicates a HoH increase, ▼ indicates a HoH decrease)		
		Sub-Industry Classification	No. of Companies
ICT Services	11 (▲1)	Software	8 (▲2)
		Information services	3 (▼1)
Distribution/Services	6 (▲1)	Wholesale and retail trade	5 (▲3)
		Professional services	1 (-)
Biotechnology/Healthcare	5 (▲2)	Medical materials/pharmaceuticals	4 (▲2)
		Medical devices	1 (-)
Game	4 (▲1)	Game software	4 (▲1)
Chemicals/Materials	3 (▲2)	Chemical materials/products	3 (▲2)
Film and TV/Performing Arts/Recording	1 (▼1)	Performing arts/exhibition/music	1 (-)
Other	1 (▼1)	Real estate/renting and leasing	1 (-)
Total	**31 (▲3)**		

Source: KVIC

The distribution of unicorns and unicorn candidates according to the Korean Standard Industrial Classification (KSIC) shows that seven of the 31 companies are from application software publishing, four from online game software publishing, and three each from database and online information provision, and manufacture of perfumes and cosmetics, two each from manufacture of other medical and surgical equipment and orthopedic appliances n.e.c., and electronic commerce on a fee or contract basis via internet, and one each from other 10 industries.

As with the HoH change in the distribution according to KVIC Industry Classification discussed earlier, the distribution according to the KSIC also reveals a HoH decline in the number of industries in which the companies being analyzed operate, to 16 industries (with 31 companies) from 20 industries (with 28 companies) in the prior half.

Table 5 **Industry Distribution According to the KSIC**

Korean Standard Industrial Classification (KSIC)	Number of Companies*
Application software publishing	7 (▲2)
Online game software publishing	4 (▲1)
Database and online information provision	3 (-)
Manufacture of perfumes and cosmetics	3 (▲2)
Research and experimental development on medical sciences and pharmacy	2 (▲1)
Electronic commerce on a fee or contract basis via internet	2 (▲2)
Manufacture of other medical and surgical equipment and orthopedic appliances n.e.c.	1 (-)
Other professional services	1 (▲1)

Korean Standard Industrial Classification (KSIC)	Number of Companies*
System software publishing	1 (-)
Retail sale of eyeglasses and lens	1 (-)
Music and sound recordings publishing	1 (-)
Manufacture of medical supplies and related other medicaments	1 (-)
Manufacture of medicinal chemicals and antibiotics	1 (▲1)
Renting of motor vehicles	1 (-)
Wholesale of electrical machinery and related materials	1 (▲1)
Wholesale of cosmetics and related products	1 (-)

* ▲ indicates a HoH increase in number, ▼ indicates a HoH decrease in number

Source: KVIC

Company Age

The average age of the 31 unicorns and unicorn candidates as of June 30, 2019 was 9.4 years. The average age was 8.7 years for five companies with a value of over KRW 1 trillion, 10.9 years for five companies with a value between KRW 500 billion and KRW 1 trillion, and 9.2 years for 21 companies with a value between KRW 200 billion and KRW 500 billion. The age of the companies varied, ranging from 3 years to 22 years. As in the previous period, we have found that the age gap between youngest and oldest companies is smaller in higher valuation ranges than in lower valuation ranges.

The average age of the companies as of June 30, 2019 is younger in almost all valuation ranges except the KRW 500 billion - 1 trillion range than the average age as of December 31, 2018.

One may expect that the average age of unicorn companies worth over KRW 1 trillion is the highest, assuming that a company grows over time. However, the findings have suggested that the companies valued at KRW 1 trillion or more are younger on average than those valued between KRW 500 billion and KRW 1 trillion, indicating that company age and company value are not always proportional to each other.

Revenue

We have also examined the revenue of unicorns and unicorn candidates calculated according to each company's accounting policy as of December 31, 2018, using the latest data available from newspapers and other sources if information on the company’s 2018 revenue is not publicly available. The analysis has shown that the average revenue of the 31 unicorns and unicorn candidates was KRW 168.3 billion. The average revenue stood at nearly KRW 470.7 billion for the companies in the KRW 1 trillion or more valuation range, KRW 213.9 billion for those in the KRW 500 billion – KRW 1 trillion range, and KRW 85.4 billion for those in the KRW 200 billion – KRW 500 billion range. It should be noted, however, that due to the nature of the industry in which they operate, some of the 31 companies do not generate any revenue, and others generate revenue of more than KRW 1 trillion, thus making revenue diversely distributed across the unicorns and unicorn candidates.

Moreover, the average revenue of the 31 companies for FY2018 is larger in almost all the valuation ranges except the KRW 200 billion – KRW 500 billion range than that of the 28 companies for FY2017 in the previous analysis.

Table 6 **Company Age as of June 30, 2019**

Valuation Range	Average Company Age (No. of years)	Oldest	Youngest
	(▲ indicates a HoH increase / ▼ indicates a HoH decrease)		
KRW 1 trillion or more	8.7 (▼1.4)	12.3 (▲0.5)	5.9 (▼2.7)
KRW 500 billion – KRW 1 trillion	10.9 (▲1.3)	14.4 (▲0.5)	6.7 (▲1.3)
KRW 200 billion - KRW 500 billion	9.2 (▼0.5)	22.1 (▼1.9)	3.3 (-)
Total	**9.4 (▼0.3)**	**22.1 (▼1.9)**	**3.3 (-)**

Source: KVIC

Table 7 **Average FY2018 Revenue**

Valuation Range	Average Revenue (100M KRW)
KRW 1 trillion or more	4,707.3 (73.4% HOH)
KRW 500 billion - KRW 1 trillion	2,139.0 (62.0% HOH)
KRW 200 billion - KRW 500 billion	853.6 (-28.0% HOH)
Total	**1,682.5 (21.2% HOH)**

Source: DART, newspaper articles

Table 8 **FY2018 Revenue Distribution**

Revenue Range	Number of Companies (▲ indicates a HoH increase; ▼ indicates a HoH decrease)
KRW 100 billion or more	16 (▲5)
KRW 50 billion – KRW 100 billion	7 (-)
KRW 10 billion – KRW 50 billion	4 (▼2)
Less than KRW 10 billion	4 (-)
Total	**31 (▲3)**

Source: DART, newspaper articles

Key Takeaways

We have analyzed the 31 unlisted companies valued at KRW 200 billion or more among the portfolio companies in the KFoF underlying funds. The findings suggest that the average unicorn or unicorn candidate company is a 9.4-year-old IT services company generating revenue of KRW 168.3 billion, raising KRW 13.4 billion from the KFoF underlying funds, and reaching a valuation of KRW 644.4 billion.

The number of unicorns and unicorn candidates rose by 3 HoH. Notably, the number of companies with valuation between KRW 200 billion and KRW 300 billion recorded the largest HoH change, growing from 7 to 15, nearly half of all the companies being analyzed. The average valuation and funding amount of unicorns and unicorn candidates declined -6.9% and -3.3% HoH, respectively. The industry distribution indicates the increased concentration of the companies in fewer industries. Overall, the average age of the companies fell by 0.3 years, and the average revenue was up by 21.2%.

We hope that KVIC's updates on the analysis of unicorn and unicorn candidates can be a great help in understanding promising VC-backed companies in Korea.

For all figures in the article, the following conversion can be used for reference: USD 1=KRW 1,100.

KVIC Next Unicorns:

(1) Zipdoc

(2) Destin Power

KVIC Next Unicorn:
This project is designed to help promising Korean companies with high growth potential attract scale-up funding from global investors and grow into unicorns by enabling them to leverage KVIC's global networks.

KVIC Next Unicorn (1) Zipdoc

Zipdoc, Interiors Design From Start To Finish

Highlights

- Korea's number-one online platform for interior design and renovation (with a 70% market share)
- High growth potential given the Korean interior design market's robust growth at an average annual rate of 14%, and the online portion of the market hovering around 1%
  (Zipdoc reported an average monthly growth of 10.7% in the number of quotation requests between 2017 and 2018)

Company Overview

Established in 2015, Zipdoc Co., Ltd. is an online to offline (O2O) platform company that matches customers who need interior designing services for residential or commercial properties with interior design and build contractors. The company enables customers to request and compare interior design quotations via its website or mobile Android and iOS apps, called 'Zipdoc,' and provides interior design trends, news and ideas through its social media channels. Despite its short history, the company has built stronger market recognition than its competitors, leading the way in the O2O interior design market.

For homeowners, Zipdoc offers a free quotation comparison service, which helps users request and compare quotations from its affiliated contractors (Zipdoc partners), along with information on completed projects, and other construction-related advice and services. Also, it provides a curation service that helps homeowners find the best interior design and build firm fitting their tastes. In addition, it offers Zipdoc Man service for construction management. Zipdoc Man refers to a dedicated, well-trained on-site construction manager who conducts site visits and acts as a mediator between the client and the contractor. This service is intended to reduce client concerns over conflicts with contractors, insufficient knowledge of construction project administration, construction quality, and customer service after project completion.

For interior design and construction companies, Zipdoc enables them to save marketing costs and increase profitability through continued customer acquisition. Moreover, with Zipdoc's platform, interior design and build contractors can create a project portfolio that showcases their past projects with before & after photos and video clips, and conduct marketing activities through Zipdoc's website and social media channels.

Table 1 Company Brief

Founder & CEO	Sung-Min Park
Date of Foundation	July 22, 2015
Location	65, Bongeunsa-ro 18-gil, Gangnam-gu, Seoul, Republic of Korea
Number of Employees	110
Number of Zipdoc Partners	Nearly 600 (1,800 in cumulative terms)
Sales Volume[1)]	Cumulative sales of about KRW 200 billion, and monthly sales of KRW 12 billion
Main services	O2O services for interior design and renovation, and Safe Services Package (Safe Zipdoc Man, Safe Quality & Rework, Safe Escrow Account, Safe A/S, and Safe 1:1 Service)
Operating Highlights	Cumulative quotation requests of nearly 140,000, and quotation requests per month of about 7,000
Contact	Website: http://www.zipdoc.co.kr Facebook: https://www.facebook.com/zipdoc

1) Sales volume or sales in this article indicates the amount of the sales of goods and services intermediated by the Zipdoc platform.

Market Opportunities

According to the Construction & Economy Research Institute of Korea (CERIK), the Korean interior design market is forecast to surpass KRW 40 trillion in 2020. That is because people show growing interest in and demand for changing their living environment, spurred by a rise in the number of old, worn-out houses, growth in repairs demand for rental housing, an increase in per capita income, and rising desire for self-expression.

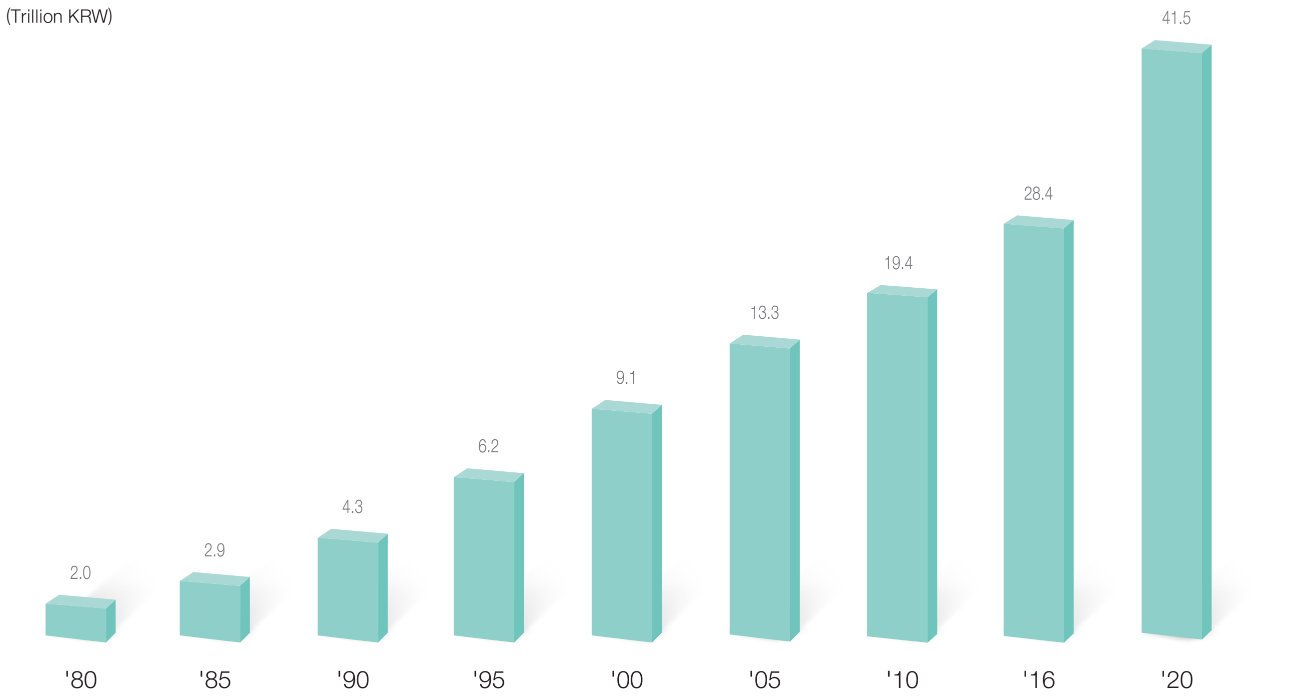
Against this backdrop, the O2O interior design industry has been recently expanding at a rapid pace with large-scale fund raising and a flurry of new services. Marketing competition becomes fiercer to be the first to market. And there are expectations towards innovation in the existing industry in which information asymmetry exists.

The interior design industry has so far been dominated by small businesses targeting local or regional clients due to the unfledged online market. 70% of customers chose interior design and build contractors near their location or through referrals from their friends and acquaintances, which suggests asymmetric information. Customers had to spend a great deal of time on finding the right contractors that suit their tastes among nearly 40,000 contractors across the nation, and requesting and comparing quotations. Without professional knowledge, customers were often worried or anxious because they did not fully understand the construction process. On top of that, the market has been riddled with problems related to construction quality and a contractor's failure to fix construction defects after project completion. In the meantime, interior design and build firms or home renovation contractors found it difficult to acquire customers in the absence of effective or useful marketing channels. Their disorganized, messy working process caused conflicts with clients.

Key indicators to measure the growth of an interior design platform are cumulative sales intermediated by a platform and the pace of sales growth. Zipdoc has taken the number-one position in the market in terms of cumulative sales (with a 70% market share), becoming the first online company to reach KRW 200 billion in cumulative intermediated sales.

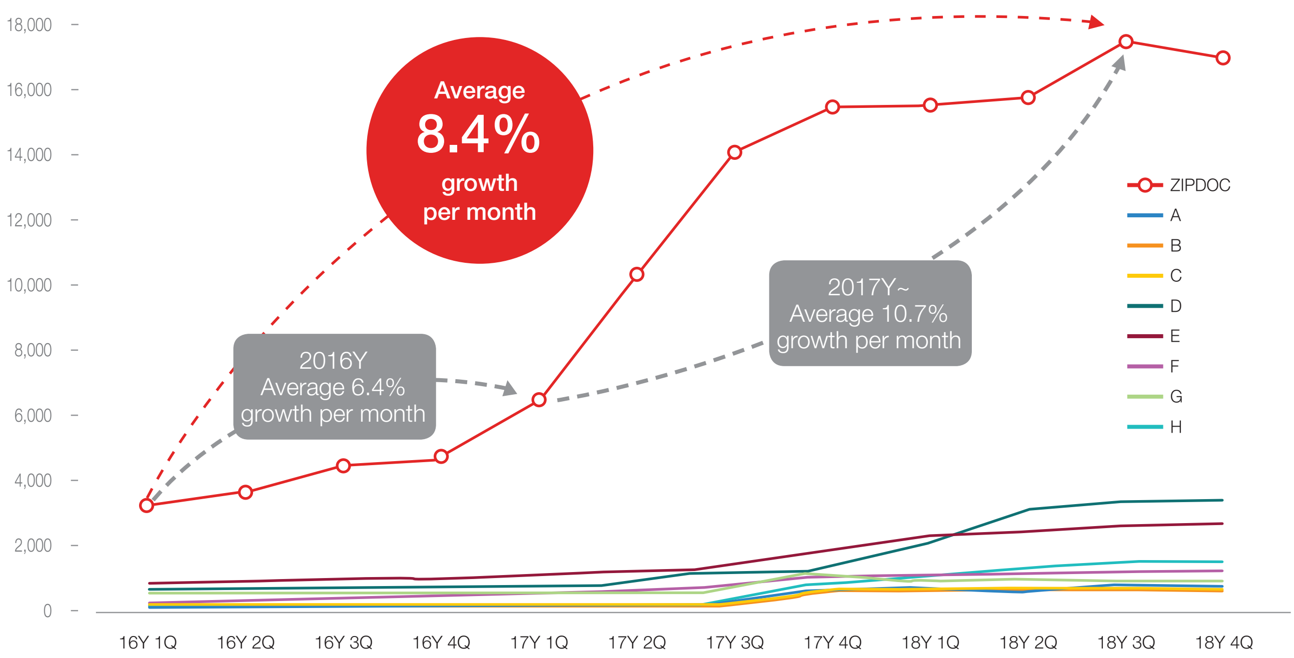
The number of interior design and build inquiries in the Korean market is estimated at 800,000 per month (including overlapping inquiries). This estimate is based on the assumption that there are roughly 40,963 firms, each of which receives 20 inquires per month. The number of online quotation requests is estimated at 8,000 per month, suggesting that the online portion of the market is around 1%. As shown in the increasing number of monthly quotation requests made to Zipdoc, and overseas cases, however, the Korean interior design market is expected to go online rapidly. Given that, growth prospects look bright for Zipdoc that has occupied the formidable position in the O2O interior design market.

Figure 1 Forecast of Korea's Interior Design Market Size



Source: CERIK

Figure 2 Market Share for Online Quotation Request (unit: case)



Source: Zipdoc's IR materials

Overseas Success Stories

Two successful companies that provide O2O platforms for interior design and renovation similar to Zipdoc's platform

1 Houzz (USA)

Formed in 2009, Houzz is the world's largest online platform for home remodeling and design. Through its platform, the company advertises and sells home accessories, and connects customers with home improvement professionals. It has nearly 40 million monthly active users (MAU). Houzz, which was valued at about KRW 4 trillion in 2017, is considered the most successful company in the online interior services sector.

2 To8To (China)

To8To launched a one-stop interior portal in 2008. With 70,000 contractors and 850,000 interior designers signed up for its platform, the company provides services in over 200 cities throughout China. To8To connects homeowners with contractors, offering offline construction management services (monitoring the progress of home improvement projects and assessing the service quality of contractors), and providing an escrow online payment service.

Table 2 Houzz (USA)

Year of Funding Round(s)	Investors	Funding Amount	Valuation
2010	Orens Capital	USD 2 million	-
2011	Sequoia Capital, etc.	USD 11.6 million	-
2013	Sequoia Capital, Comcast Ventures, NEA, GGV, and KPCB	USD 35 million	-
2014	Sequoia Capital, Comcast Ventures, NEA, GGV, KPCB, and DST Global	USD 165 million	USD 2.3 billion
2017	Sequoia, NEA, GGV, etc.	USD 400 million	USD 4 billion

Table 3 To8To (China)

Year of Funding Round(s)	Investors	Funding Amount	Valuation
2014	Sequia Capital	USD 16 million	-
2015	Sequia Capital, 58.com, and Matrix Partners China	USD 200 million	USD 4 billion

Main Services

1) Intermediation between customers and contractors

Zipdoc matches customers with the right contractors for their remodeling needs in easy and fast manners. It helps customers i) determine their interior design style that best suits their tastes by allowing them to select the type of space (home, commercial or partial renovation), location, size, budget, and style, ii) browse and filter past remodeling examples and contractors, and iii) request two or more contractors to give them on-site quotations. One of Zipdoc's strengths is to enable users to monitor the entire process from start to finish, i.e., from a request for quotation to project completion, at a glance through its website, mobile apps (Android/iOS) or automated response system (ARS).

Zipdoc enables contractors to view quotation requests, and accept or reject interior design and build requests. Further, contractors can manage a checklist of all project stages from quotation issuance to completion, contractual terms and conditions, and project costs on Zipdoc's mobile or web platform.

2) Architect platform (Zipdoc Architect)

This platform connects customers with architects who would be a good fit for their new construction, expansion or remodeling project. Also, it helps customers get a free legal consultation, and buy building materials at reasonable prices if they sign a design and build contract with any Zipdoc partner contractor. In addition, it provides secure online payment and interest-free installment services, as well as discounts on affiliated service offers.

3) Zipdoc 2.0 project

With the slogan, "Simple and Safe Interior," Zipdoc 2.0 project introduces Safe Services Package aimed to remedy inconveniences in the interior design market in the hope that a culture of trust and reliability takes root in the market.

① Safe Escrow Account Service
- Customers can put their payments in Zipdoc's escrow account for holding until the contractor completes different stages of the project.
- The escrow account service protects customers in the event that contractors deliver poor quality or incomplete work after payment, and also protects contractors in the event that customers refuse to pay after work.

② Safe Zipdoc Man
- Zipdoc Man acts as a mediator between a client and a contractor, as well as an on-site construction manager.
- Well-trained professionals with at least 10 years of experience become Zipdoc Man who will make frequent visits to the construction site.

③ Safe Quality & Rework
- Zipdoc pays the costs of rework in case that the quality of a contractor's work performed does not meet the contract specifications and rework is needed.

④ Safe A/S
- In addition to a one-year warranty provided by a contractor, Zipdoc offers an additional two-year after-sales (A/S) service period to customers.

⑤ Safe 1:1 Service
- Each customer is assigned a dedicated customer service manager who connects the customer with the right contractor to fit his or her specific needs, and provides contract-related support.

Figure 3 Zipdoc's Platform

Table 4 Strengths of Zipdoc's Platform

	Customers	Contractors
Problems with the current interior design & build market	1. Difficulty finding and selecting contractors; 2. Concerns about construction quality and on-site supervision; 3. Concerns about after-sales service (A/S)	1. Inefficient marketing activities; 2. Conflicts with customers; 3. Difficulty acquiring customers
Zipdoc's Strengths	1. Easy comparison of quotes; 2. Dispatch of an on-site construction manager, helping customers build trust in the quality of their contractor's work; 3. Three years of A/S guarantee, leading to lower repair costs	1. Cost reduction in marketing; 2. Focus on construction, leading to quality improvement; 3. Influx of closed deals, resulting in profitability gains

Business Model/ Funding

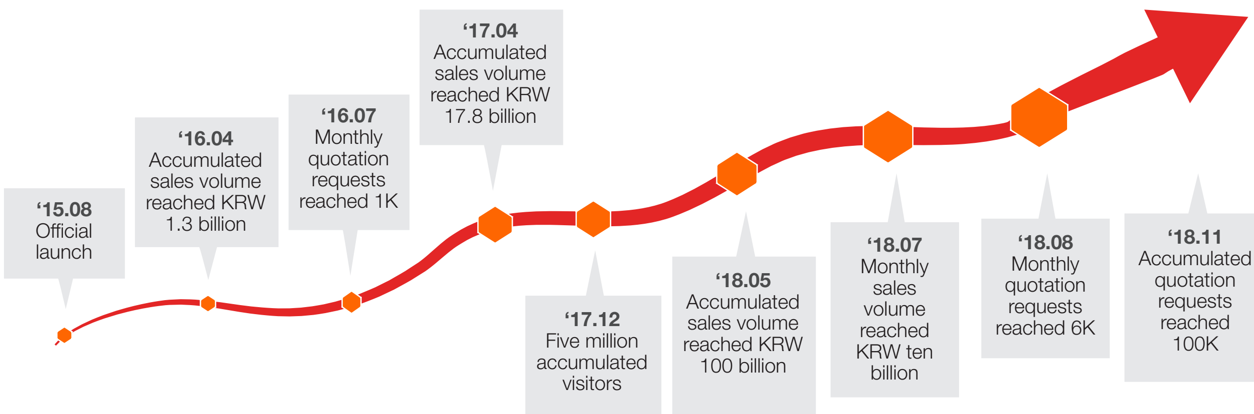
In Zipdoc's business model, there are two main revenue streams: Flat monthly membership fees from partner contractors and commissions applicable to contracts.

Zipdoc's revenue model

- Monthly membership fees collected from its partner contractors in return for providing information on quotation requests from customers(fees are charged per contractor)
- Commissions equaling 5% of the contract price when a deal is closed (commissions charged to each contract)

Zipdoc is the fastest-growing interior design online platform in Korea in terms of key growth indicators such as the number of quotation requests, the number of contracts closed, the number of partner contractors, and the amount of total contracts. It has been garnering attention from domestic and international venture capitalists.

Stage	Year of Funding Round(s)	Funding Amount	Investors (VC)
Series B	2018	KRW 13 billion	SmileGate Investment, KB Investment, Maple Investment Partners, Mega Investment
Series A	2017	KRW 50 billion	Altos Ventures, Kakao Investment, Capstone Partners, Korea Development Bank (KDB)
Angel/Seed	2016	KRW 15 billion	Bigbang Angels, Synergy Partners, Capstone Partners, Seoul Investment Partners



Strategies Going Forward

In recent years, Zipdoc has been striving to expand into the business to business (B2B) market with a particular focus on interior design franchise. It has forged business alliances with Rehoboth Business Incubator (shared workplace chain), ingstory (premium private library chain), and Dairy Queen Korea (fast food chain). Many more B2B contracts are in the pipeline.
In addition, Zipdoc is trying to expand its business portfolio gradually to include other related businesses, such as commercial interior design and specialty improvement, in which the company can take advantage of the existing platform. Furthermore, it plans to enter markets for architect & design, building materials, home furnishings, and home care.

Expansion of platform business	Specialty home improvement	Offer matching service for specialty home improvements in kitchens, bathrooms, living rooms, and other areas.
	Expansion into commercial interior design	Cater to cafes, offices, and other commercial spaces.
	Entry into the B2B market	Provide matching service for new franchise stores.
	Increase in target regions	Broaden the coverage of Zipdoc partners.
Expansion into related markets	Entry into the building materials market	Procure building materials in large volume at lower prices and sell them to its partner contractors.
	Entry into other markets	Enter markets for architect & design, home furnishings, home care, etc.

Leadership

Sung-Min Park, CEO

2015 - Present	CEO, Zipdoc
2014 - 2015	Co-CEO, Abba Company ("Yoribeory" online food ordering and delivery service)
2011 - 2014	CEO, Freero Soft (system integration company specialized in providing intelligent queuing system)
2009 - 2011	CEO, Distribution Club (social commerce operator)
2008 - 2009	CEO, Saeyan (real estate agency and developer)
2005 - 2008	CEO, House-i (interior design and build reverse auction provider)
1998 - 2005	Director, Wooshin Interior

Sung-Min Park is the founding CEO of Zipdoc. He is a serial entrepreneur, having already launched many startups before founding Zipdoc. With his ample startup experience, he established Zipdoc in 2015. Buttressed by the entrepreneurial belief and pursuit that interiors are a turning point in life, and Zipdoc is a firm helping customers experience a happy turning point in their lives, he has been exerting ceaseless efforts to delight Zipdoc customers from beginning to end beyond offering an online market place for connecting customers with interior design and build contractors.

KVIC Next Unicorn
(2) Destin Power

Destin Power, Innovative Provider of Power Conversion Solutions

Highlights

- Korea's largest, and the world's second largest provider of ESS PCS products (as of 2017) in the global ESS market estimated to maintain a solid 44.4% annual growth by 2025
- A formidable competitor to global leaders in the areas of hydrogen fuel cell inverters and fast charging systems for electric vehicles

Company Overview

Destin Power Inc., a developer and manufacturer of energy storage system (ESS) products, has grown to Korea's top provider of power conversion systems (PCS) for energy storage systems, leading the large-capacity PCS market for only four years since its establishment in 2012. By applying hybrid SiC-IGBT devices to PCS for the first time, the PCS products achieve the highest conversion rate in the world. The company has expanded globally, in the renewable energy and peak-shifting markets in the United States (Guam and California), Canada, the United Arab Emirates, Thailand, Taiwan, the Philippines, etc.

In 2017, the IHS Markit survey ranked Destin Power the second among global suppliers of ESS PCS. The cumulative capacity of ESS PCS set in operation amounted to 530 MW as of the end of 2018, including the 92 MW frequency regulation ESS project, the largest in Korea, commissioned by Korea's national electric utility KEPCO. Another accomplishment is the provision of 16.8 MW wind power ESS PCS, boasting the highest capacity in Korea.

Leveraging its core technologies associated with ESS, PCS, and power management systems, Destin Power has dramatically transformed its business portfolio from an early-stage, order-based to a product-oriented model. Its electricity conversion technologies have formed a solid basis for the company's long-term objective, growing into a total energy solution provider.

Going forward, the global market is expected to see steady growth in eco-friendly power generation as well as the power market for managing private sector demand. Against the backdrop, Destin Power's growth pace will continue as its wide-ranging product lineup and one-stop service from installation to maintenance could perfectly cater to market demands, with its local and global partners in close cooperation in its major markets.

* Power conversion systems (PCS): This refers to a conversion system that converts direct current into alternating current and vice versa, so as to connect a battery to a power system. It also helps control differences in voltage, frequency, and other features that may occur when power is stored or used.

Table 1 Company Brief

Founder & CEO	Sung-Jin (Seth) Oh
Date of Foundation	August 1, 2012
Location	Pangyo 7 Venture Valley (3-Dong, 9FL), 15, Pangyo-ro 228-gil, Bundang-gu, Seongnam-si, Gyeonggi-do, Republic of Korea
Number of Employees	90
Key Products	Development and manufacturing of ESS PCS, solar inverters and UPS
Patents	13 (including one U.S. patent)
Contact	Website: http://www.destin.co.kr

Market Opportunities

Energy market research institution SNE Research forecasts the global ESS market to grow further to USD 29.2 billion (90.4 GWh) by 2025 from USD 2.6 billion (6.9 GWh) in 2018. In line with the rapid growth, the market for PCS, core parts for ESS, is expected to expand as well.

ESS is a system that stores electricity until being used upon demand. It comprises a battery, a battery management system, a power management system, an energy management system, and a PCS. Although frequency regulation, peak shifting, and other systems for stabilizing and controlling power currently represent the largest demand in the energy market, fast growth is expected with increased adoption of ESS as a core part in other subsectors, such as renewable energy, energy storage for managing demand, industrial and micro grids, etc.

ESS levels out power demand by charging during light-load hours (storing power at night when electricity demand is low) and discharging during peak hours (supplying electricity during peak times with high demand). Power generation using ESS helps the user cut costs and secure profits via arbitrage transactions from time-of-use price differences, which could contribute to peak cuts as well as stability in power supply and demand. Aiming to fully leverage such benefits, the Korean government has embarked on KEPCO's frequency regulation project and provided several policy incentives since 2015, such as the special ESS pricing scheme, increasing the REC weight to raise prices of electricity from ESS linked to renewable energy, mandating public institutions to install ESS, etc.

Also, Korea has rolled out the Renewable Energy 3020 Plan to raise the share of renewable energy up to 20% or 48.7 GW by 2030, with 97% of renewable energy being solar ray and wind power. This helps promote its policy drive to boost the penetration of ESS linked to renewable energy. Although the onerous initial investment outlay was a drag on ESS penetration, public-oriented policy incentives tend to give a boost to ESS's rapid penetration. Not only Korea, but also several governments are encouraging ESS penetration, which rapidly shifts the paradigm of power management.

According to U.K. energy consulting firm Wood Mackenzie Power & Renewables, the U.S., a leader in the global ESS market coming in second behind Korea, is forecast to see its ESS installment dramatically rise 72.1% annually to 11,744 MWh in 2025, from 777 MWh in 2018 as the country tries to cope with instability of aging power grids as well as increased penetration of renewable energy. Against the backdrop, the U.S. unveiled a legislation that applies its solar Investment Tax Credit (ITC) to other renewable energy sources, while California passed the 100 Percent Clean

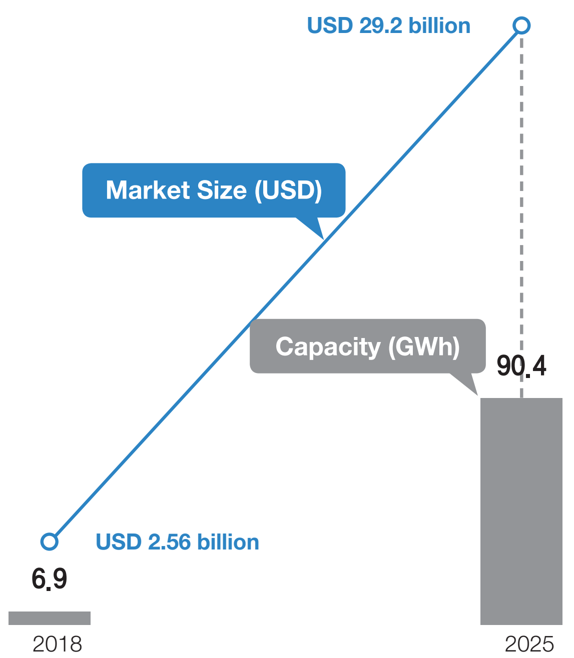
Energy Act of 2018 that is to meet 100 percent of its energy needs with clean power by 2045. In February 2018, the Federal Energy Regulatory Commission (FERC) issued Order 841 that allows regional grid operators to commercialize the electricity stored in ESS. Although growth in the U.S. ESS market was largely fueled by mandatory schemes in states such as California, New York, New Jersey, and Massachusetts, the main source of the rising demand is expected to come from for-profit-activities of grid operators. Under Order 841, all grid operators should put forward their concrete ESS-utilizing plans to FERC. Successful legislation of tax credits on top of this will further accelerate the growth pace.

On the other side of the planet, Australia is driving for introducing ESS for renewable energy via its large-scale project linking wind farms and ESS as part of its efforts to deal with power shortages that once caused blackouts. The market for residential power is also expanding due to policy incentives for ESS, and the ending of its feed-in tariff program. In Europe, Germany and the U.K. are leading most of the frequency regulation projects for grid stabilization in progress, triggering a demand increase in both large-scale and small-scale residential ESS. European wind farm operators such as Vestas and Orsted have already set up an independent ESS division that will install ESS when building a wind station.

Table 2 Policy Incentives for ESS in Major Players

Nation	Policy Incentives
U.S.	· Department of Energy carried out empirical research and investment in ESS. · New York rolled out an incentive program for ESS installation. · California pays subsidies for solar-linked ESS and mandates ESS to take up a certain percentage of power supply.
Japan	· Pays up to one-third the cost for ESS installation. · Saitama Prefecture pays subsidies for residential ESS.
Australia	· Increased number of large-scale hybrid (wind, solar, ESS) power plants · Each state offers different ESS incentive programs.
Germany	· Provides 30% of the initial outlay for solar-linked ESS.

Figure 1 Global ESS Market Forecast



Source: SNE Research; Ministry of Trade, Industry and Energy

Key Product Lineup

1) Fuel Cell Inverter

Destin Power's full cell inverters boast high confidence and superb performance, perfectly fit for long operating hours of fuel cell power generation.

2) AIO ESS

This integrated, all-in-one ESS product fully reflects the needs of the current market where a wide variety of policy incentives exist for renewable energy. By integrating PCS, lithium-ion batteries, inverters, incoming and distribution panels into one, the All in One product offers easy transport and quick installation at a competitive price as its manufacturing cost goes 30% down from that of the previous same-capacity product. Capable of being used for peak cut, renewable energy connection, frequency regulation and many others, the product enables a one-stop service for building an ESS linked to solar ray.

3) ESS PCS

Destin Power's flagship ESS PCS is an individually operable, modular product offering flexibility in capacity configuration. Its strengths include, but not limited to top-notch power density, improved operating efficiency by multiple (N-1) operations, less unbalancing via P+R controller, quick responses, better crisis management based on variable AC output filter structure. The whole process from manufacturing to quality assurance before shipping carefully and fully considers customer needs, which is then adequately reflected in product development and designing. Enhanced remote monitoring is provided for maximized maintenance support, as well as for higher stability in systems and power quality assurance.

4) Multi-Function PCS

Equipped with the UPS conversion function integrating power-system and the micro-system ESS, this micro-grid PCS helps multiple power operators manufacture and supply electricity to certain regional power grids based on two-way transmission and distribution. This helps stabilize power supplies and make the use of energy more efficient.

5) Solar Inverter

This 1,500 VDC solar inverter boasting high power density and compact size is for large-scale solar PV systems, meeting the demand for enlarging solar power plants.

6) Hybrid Inverter

By integrating the solar inverter and ESS PCS, this efficient micro-grid solution helps not only cut costs, but also require less space for installment.

7) Industrial UPS

Destin Power's industrial UPS is based on a 420 kVA power conversion module. It is highly cost-effective with its rated efficiency being higher than 98%.

Table 3 Destin Power's Product Lineup

Business Area		Brand	Product Line-Up
Energy Storage PCS	· Frequency Regulation · Renewable Energy Integration-Smoothing Power Shift · Peak Cut	SAVEEN GT L	100/200/250/500/750/1000kW
		SAVEEN GT H	0.25/0.4/0.5/0.8/1.2/1.6/2.0/2.5MW
		SAVEEN EVE	10, 20 ~ 200kW
		SAVEEN CP	0.4/0.8/1.2/1.6/2.0/2.5MW
All-In-One Energy Storage	· Easy-to-Install Energy Storage	All-In-One	50-110/75-250/75-300/100-300/ 400-1500/800-3000/2000kW-6000kW
Multi-Function PCS	· UPS+ ESS Combination · Emergency Generator replacement · Micro Grid	SAVEEN MG LV	250/500kW
		SAVEEN MG HV	1.25MW
Fuel Cell Inverter	· Fuel cell power conversion	SAVEEN FC	440kW
Industrial UPS	· Industrial UPS · Sag Protector	STABLEEN M	300/500/600/900/1200kVA
Photovoltaic Inverter	· Inverters for large solar power plants	APOLLEEN	500kW
		APOLLEEN	1.25/2.0/2.5MW
Hybrid Inverter	· Hybrid Inverter (Solar + Energy Storage)	SAVEEN EVE HYBRID	10/20 ~ 200kW

Source: Destin Power's IR materials

Figure 2 Product Strengths

High Efficiency & Reliability

- **Rated efficiency : 98%** (SAVEEN GT HV, Using SiC IGBT)
- **Minimize IGBT Switching Loss by applying SiC IGBT**
- Unpredictable system error minimization algorithm-A2 power conversion configuration and control technolngy (Patent)
- Increased efficiency and reliability by (N-1) operation (Patent)
- System design based on 20yrs of life expectancy
- CE Certified (UL in 2017)

Flexible & Convenient Modular Design

- **Modular Design of PEBB (Power Electronic Building Block) of 125KW & 420kW**
- **Compact Size-8MW PCS can be installed in 40ft container**
- Flexible capacity design for customer requirements - 20kW~300kW, 500/750kW, 1.0/1.2/1.6/2.0/2.4MW Lineup

High Performance & Reliability

- **P+R Controller - Reduce THD and unbalancing compare to DQ controller**
- Provide Active/Passive damping filter - Perfect solution of resonance problem
- Parallel operation without communication line
- **UPS function - Operating with 100% Line**
- Interactive UPS during blackout (Voltage source ↔ Current source mode, **Seamless Control**)
- Full Grid Support - fault ride through (FRT) function

Easy Operation & Serviceability

- Real-time remote monitoring and diagnosis
- Provide various communication solution
- **Exclusive built-In Power Manager can be embedded (PMS based on LINUX)**
- **Plug type PEBB design : Fast replaceable IGBT stacks - MTTR 20 minute**

Source: Destin Power's IR materials

Figure 3 All in ONE ESS

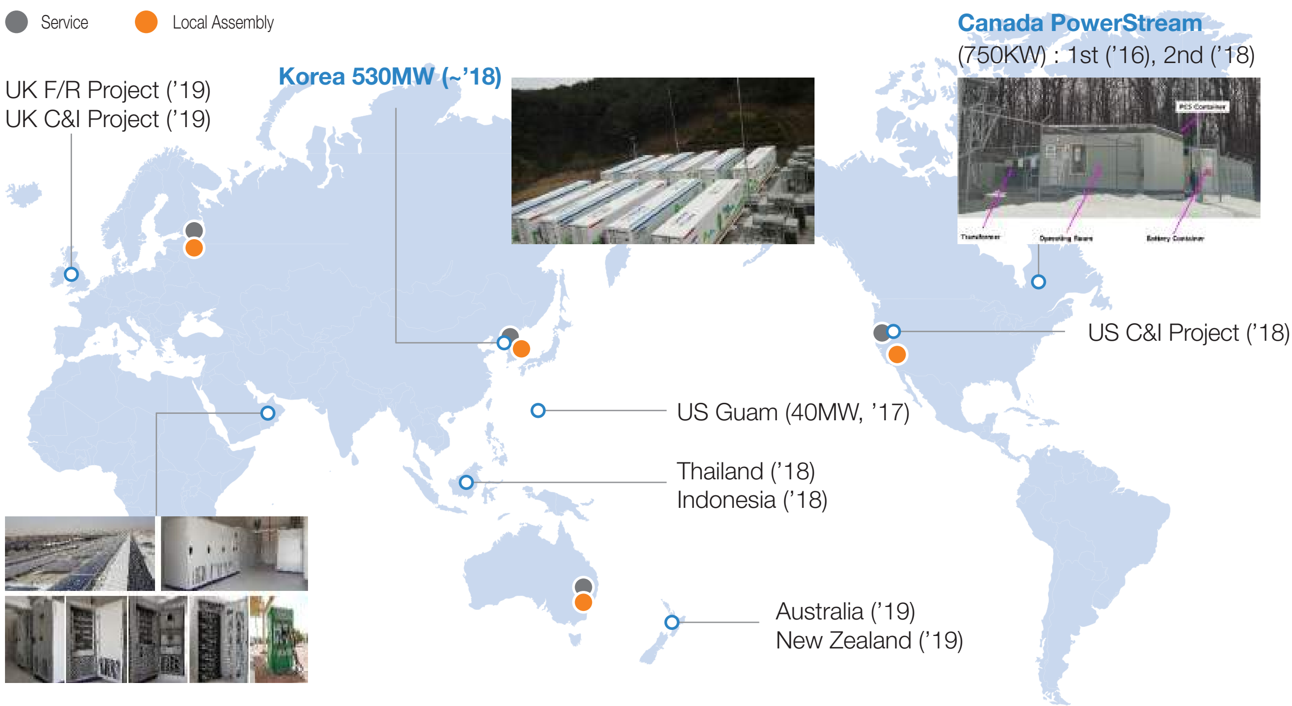
Business Model/Funding

Destin Power's revenue model consists of two lines of sales activities: One from selling, installing, and providing maintenance of PCS-related products; and the other from ESS projects for domestic and overseas plants and operators. Launched in 2018, the All in One ESS took up 24% (KRW 13.2 billion) of total sales and contributed greatly to the company's bottom line. Also backed by 440 kW fuel cell inverters' mass production and sales increase, Destin Power's 2018 sales rapidly grew three-fold from the previous year.

Along the lines of its participation in large-scale projects commissioned by both domestic and foreign customers, Destin Power has built a proven track record and solid partnerships with about 18 partners in ten countries. This fast-growing firm with readily available top-notch technologies have been attracting VC attention as the growing global demand for ESS and policy incentives of several governments form a favorable business environment.

Stage	Year of Funding Round(s)	Cumulative Funding Amount	Investors (VC)
Series A/B	2016-2018	Approx. KRW 13 billion	Seven VC firms including Samsung Venture Investment and Kolon Investment

Figure 4 Global Track Record & Operation



Dubai Smart Station ('16) : DEWA
Kuwait Smart Grid Station ('16) : KNPC(Kuwait National Petroleum Co)

Source: Destin Power's IR materials

Strategies Going Forward

Fueled by its success in PCS and AIO products, Destin Power is gearing up to increase their sales of fuel cell inverters, industrial UPS, PV inverters, and widen their target markets such as the U.S., Japan, Australia, New Zealand, Asia Pacific and the EU by 2020.

Going forward, Destin Power strives to position itself as a total solution platform, developing its independent power producer model and pioneering the way to energy storing demand for innovative transportation such as electric and hydrogen vehicles. Destin Power has recently built a next-generation plant equipped with up-to-date technologies such as the smart factory, digital twin, and machine vision systems in the Naju Energy Valley, Korea's innovative industrial complex. In this newest plant, the company plans to begin manufacturing ESS PCS, hydrogen fuel cell inverters, and fast charging systems for electric vehicles as early as next month.

Leadership

Sung-Jin (Seth) Oh, CEO

2012 - Present	CEO, Destin Power
2007 - 2012	Head of Research, Kaco New Energy
2003 - 2007	Chief Researcher, Ewha Technologies Information
1999 - 2003	Researcher, Hyundai Information Technology
1995 - 1999	Researcher, POSCO ICT

Sung-Jin (Seth) Oh, a former power control engineer, is the founding CEO of Destin Power. He began his engineering career at POSCO ICT, working on 2.25 MW rolling speed controls for the wire rod factory. After carrying out a localization project for elevator VCI at Hyundai Information Technology, he led the development of Korea's first digital-controlled UPS at Ewha Technologies Information. As Head of Research at Kaco New Energy, he set out on a venturesome journey - developing and commercializing the world's most efficient solar inverter, acquiring KIAT's Green Certification and the UL certification, and building up experience at the world's largest 400 MW solar power plant, via which he came to discover ESS's market potential. In 2012, he founded Destin Power after resigning as Head of Research. Destin Power is exerting its utmost efforts to be the world's best power conversion solution provider and thus to accomplish its mission of contributing to prosperity for all.

KVIC

Korea Venture Investment Corp